# BRITISH ORTHOPÆDICS *

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As a surgical art, orthopædics in Britain was advanced by men who, first of all, were general surgeons but who recognised the importance of efficient initial treatment as the first stage of rehabilitation. They planned and worked for what we inherit today. We must plan for tomorrow.

## A Nation-wide Organisation

Before the first world war open-air hospitals for crippled children had been established at Baschurch, Heswell, Alton, and Stanmore. They owed much to the pioneer work at Berck and call to mind the ideas of Delpéche of Montpellier. During the 1914–18 war a milestone was found in the curative workshops established by Robert Jones as an early essay in the techniques of rehabilitation by work.

Then, in 1919, Robert Jones and G. R. Girdlestone described a plan for the nation-wide organisation of orthopædic services. As a result, a new charitable body was formed, the Central Council for the Care of Cripples, whose object was to form a national service for orthopædics—a service to cover the country through the work of local independent voluntary bodies in collaboration with the medical staffs of local-government authorities and with general practitioners. This work was facilitated by national legislation—notably the Education Acts of the early 1920s which gave local authorities the power to provide treatment and education for physically disabled children. It was also greatly helped by the munificence of Lord Nuffield through his special fund for orthopædic development.

Country orthopædic hospitals were built having peripheral outpatient clinics where the consultative work of visiting surgeons made possible the diagnosis of incipient or established disability, its effective treatment, and the supervision of patients before or after treatment in the central hospital, with provision of splints and other surgical appliances. Such clinics, as a link between the central hospital and the local medical practitioners and public-health authorities, were an educative influence of social and medical importance.

The basic ideas included the segregation of patients in units designed for the purpose, under the care of teams of specially trained men and women, with unity of control and continuity of treatment from the earliest phase of disability until complete restoration or rehabilitation had been achieved. Furthermore these schemes took a special service to patients in the most remote parts of the country. Indeed, they foreshadowed features of our present National Hospital Service.

Since there were few specific remedies, the dominant medical principle was physiological control or rest, associated with the correction of deformity, maintenance by splintage (and by surgery when necessary), and locomotor re-education by graduated physical exercise. Every member of the hospital team had to be fully informed of the social implications of each patient's condition: education and occupation were fundamental therapeutic aids. These were the characteristics of provincial orthopædics: by comparison I think it fair to say that in these regards London was somewhat backward. We should recognise the important part played by far sighted lay men and women who galvanised local public opinion and compelled the community to provide for its disabled. We should not forget Dame Agnes Hunt, Lord Mayor Treloar, Winifred Duchess of Portland, Dame Georgiana Buller, and many others.

## The Basic Ideas

Let us examine these basic ideas a little further.

*Segregation*

In the early days of orthopædics segregation was essential. Sufficient accommodation could not have been found in general hospitals, even if the people controlling them had been willing to give it; and it would have been unsuitable for the long-term treatment of children and adults by the methods regarded as necessary. Sites for hospitals were found among the rural delights of the English countryside; often alas! far from the amenities of the towns. Although this was very healthy it made for geographical isolation and difficulty in staffing. Furthermore it had some risk of engendering intellectual isolation. But this was counterbalanced by our predecessors' breadth of outlook—that of the physician who possessed at his fingertips all the facility of the general surgeon of those days.

*Special Buildings*

The buildings constructed for these new hospitals were often envisaged as temporary. Partly this was due to the relative poverty of the new charitable bodies. Yet one of the great social leaders of the time told me that her new orthopædic hospital was planned to last thirty years; for, as she thought, all crippling conditions would then have been dealt with or prevented. That was long before penicillin and streptomycin, but she was nearly right. For the work of today such hospitals as hers are now very largely unsuitable.

*Orthopædic Surgeon and Team*

The second generation of orthopædic surgeons, among whom I must count myself, were trained in general surgery even though we did not go out into the world to practise it. Much of the general surgery we learned was, of course, in the field we now regard as orthopædic—fractures, tuberculous disease, osteomyelitis, derangements of the knee, and the surgery (rather primitive) of the hand. An important part of the background of our training was practical experience in the departments of anatomy and pathology. We learned by teaching others and by observing our betters. We visited European centres and there were impressed by the great surgical clinics, although we sometimes felt that their control was a trifle dictatorial. From America we learned the value of departmental and interdepartmental conferences and "grand rounds" where even the youngest of us was expected to have an opinion.

From our own British provincial orthopædic centres—from Oswestry and from Oxford in particular—we learned a social approach and a different type of team, working in the dispersed outpatient clinics I have mentioned. The

* From the presidential address to the British Orthopædic Association on April 30.

central orthopædic hospital, apart from having a highly skilled nursing service, had an organisation geared for every activity appropriate to the education and creative occupation and happiness of the patients. Workshops in hospitals, making surgical appliances, formed the vital link between surgeon, craftsman, and patient. As yet we were not fully alive to the evils of long separation of children from their homes, but gradually we did recognise that decubitus brought various physical evils peculiar to itself.

Thirty years ago the orthopædic surgeon in training was a relatively rare creature. There was any amount of work for him to do—he did not fall over others in innumerable lecture courses, and he usually reached consultant status at the age of about 30.

*Continuity of Treatment*

Continuity remains an essential concept in orthopædic practice. Alongside many of the provincial orthopædic centres colleges were set up for the vocational training of disabled people, in which aftercare could be undertaken still by the local orthopædic staff. As important have been the industrial rehabilitation units, established by certain industries within their own factories but often linked to the local orthopædic service.

The history of orthopædics is a history of emancipation —emancipation from the older surgical idea that if a disability had a surgical cure it was within the competence of any well-trained surgeon for as long as it had a surgical interest; otherwise it was passed into the hands of other people (who were conspicuous by their absence).

## The Future

Since the war our Governments have rightly given first place to education and the building of new schools. The time has now come for considerable new hospital building. What are to be the special concern of orthopædics in the hospitals of the future?

Segregation is still important but there can be no justification for *isolation*. No disability is limited in its effects to the locomotor system. What was peculiar in the principles of orthopædics forty years ago is (or should be) accepted by all branches of medicine today. Orthopædics has, of course, its own techniques and special problems, which must be housed appropriately; but new orthopædic departments should always be within the curtilage, or in the close vicinity, of general hospitals—which more and more should be rebuilt at the periphery of our towns.

A new type of segregation is necessary. As in thoracic disease, gastroenterology, and neurology, so in the disorders of the locomotor system there is no clear distinction between the medical and surgical interests. If it is not practicable to nurse medical and surgical patients in the same ward we should at least construct wards in pairs—one surgical and the other medical—and every team should combine the two interests. Each special subject might have its own pavilion, its own administrative and secretarial staff, and the other ancillary departments appropriate to its needs.

*Children's Orthopædics*

In Great Britain the diminution of children's work renders our title almost a misnomer. Not only has tuberculosis nearly disappeared and osteomyelitis become less tedious; the more efficient treatment of poliomyelitis in its early stages has reduced the amount of surgical work required and we are hopeful of the disappearance of the disease itself. In children we shall be left with congenital deformities and the oddities of developmental origin and some fractures.

Into the whole field many new pædiatricians have come, and, although they can do no more for the interesting bony dysplasias than we can, the habit of sending such diseases to them has resulted in many other diseases such as osteomyelitis also being sent to them by general practitioners, with the risk of delayed surgical treatment. This again emphasises the need for combined medical and orthopædic units.

Children's work in the past was the important field in which orthopædic surgeons were trained. The physical plasticity of youth—the zest of life in the present and the forward look to the future—made easy the coaxing of limbs out of deformity, the patient acceptance of new adventures and of training of mind and body. All this required highly trained hospital staffs, especially in nursing, physiotherapy, and education.

What we must do is to see that enough centres for this work are maintained. I would agree that, where possible, children are treated in hospitals near their homes, if not at home; but surgeons should not allow themselves to undertake complex long-term work away from special centres. Thus I deprecate the recent tendency to appoint men to do general orthopædic work at general hospitals in isolation from first-class centres of orthopædics.

*Adult Orthopædics*

Excluding traumatology, more than half of orthopædics seems nowadays to be concerned with stress and degeneration in and around the joints of the pelvic ring.

How far is stress in the lumbar spine an aftermath or war and of chronic fatigue? Is it due to too much work and bad feeding? Is it perhaps due to exerting oneself too little and to overfeeding? Is it the result of sitting too much at the television screen, or working with a badly flexed spine? How far is it due to social disharmony or to indiscipline of all kinds? Is it related to a general state of insecurity or is it aggravated by the provision of social security?

I can't answer these questions in paradox. Nevertheless I am sure that had general orthopædics in this country not been so heavily burdened by this great problem of the chronic low-back disorder we should have made much more advance elsewhere.

Low-back strain is a social and general medical problem more than a surgical one. Physically it is not mainly a problem of bone or disc displacement but is dominantly one of muscular dysfunction and contracture. Manipulative techniques should have an important place in treatment; and so should positive efforts by the patients themselves in the way of remedial exercises and other disciplines. On the other hand most housewives would benefit from a period of recumbency each midday.

Another field in which medicine and orthopædics must work together is that badly called rheumatology. In this country many units are needed where treatment of rheumatic diseases can be given near the patient's home. Gone are the days of magic and magnificence in hydros and spas. Physiological control by splintage, with physical measures and occasional surgery, must be timed to fit into a well-planned medical campaign. Physicians in rheumatology working in association with orthopædic surgeons could maintain a broadly based interest in general medicine and could make orthopædic medicine a special field of the highest value instead of, as now, a rather narrow and somewhat exotic sideline in therapeutics.

The surgery of the hand is a matter of interest to both orthopædic and plastic surgeons, and it is important that we should be adequately represented in it. Our knowledge

of special splintage, the preservation of tissues and reconstructive surgery in joints, and tendon transposition and grafting has large scope in the hand. Nevertheless, as Guy Pulvertaft and Paul Brand have shown, a greater technical delicacy is required than is habitual in much of orthopædic surgery.

In Great Britain, to meet the needs of war pensioners, the care of patients after amputation has been transferred to a separate national service under the Ministry of Health. This divorce of a traditionally orthopædic responsibility is not good. It is time that this work was closely associated with the orthopædic services.

### Accident Surgery

J. C. Scott has lately reminded us that injury is the biggest single cause of death and disability among the most active and productive members of the community. All of us are aware of the growing number of elderly people coming to our hospitals with fractures. It is said that on an average day 45 people in this country lose their lives from accidents—16 in travel, 5 at work, and 24 in or about the home. In industry accidents are responsible for more loss of working time than any other cause, including industrial disputes.

These figures present a challenge which we must face. Accident services in Great Britain, and probably throughout Europe, require continuous overhaul and modification with the changing circumstances of life.

The memorandum on this subject by the executive committee of the British Orthopædic Association † follows very much the lines of our previous memorandum, published in 1943, but is amended according to present needs. The defects which we find are in accommodation, in staffing, but most of all in *organisation*. The paradoxical situation is that we have not too few hospitals treating accidents, but in many places too many. Often they are too small and insufficiently staffed to provide an efficient twenty-four-hour service.

The problem is one for the community as a whole to tackle as though it were a big military operation. 16,000 deaths a year from accidents is a grim figure. How much greater is the figure of misery and disability.

While prevention of accidents is largely a community problem of self-discipline, Christian charity, and good workmanship, and thus for education and precautions, there is also a vital need for prevention of a different type. The most important single step in the prevention of disability, and therefore in rehabilitation, is *efficient initial treatment*.

Our report recommends a nation-wide organisation with accommodation, equipment, and staff for the treatment of all varieties of injury under the best conditions at any time of the day or night. The country should be divided into areas, which must be related to need and not necessarily to the present artificial divisions of management committees, regional boards, and teaching hospitals. The areas will vary in size from those with a radius of about 25 miles to very much smaller ones in and around the large cities. The essential is that the services must be based upon general hospitals large enough to maintain economically a continuous service.

New buildings will be required, for accident cases often embarrass the normal routine and prevent the admission of general surgical and medical cases which may be less urgent but are no less important. Segregation of out-patient accident services in a specially planned building, which is part of the general hospital, is essential.

Particular urgency attaches to the proper teaching of accident surgery to medical students and recent graduates. Many teaching hospitals are far from the areas where the accident-rates are highest. Many young doctors go out to such areas for their pre-registration house-appointments and are expected to have a competence far greater than their training and experience can justify. The supervision of their work and training must be conscientiously sustained by the consultants and other senior staff who assume responsibility for them. Orthopædic surgeons must be closely interested in the casualty department of hospitals—a place of overlapping clinical interests which should cease to act as a general-practitioner surgery.

### Conclusion

The accident and general orthopædic services of the country require much new building. The ideas of segregation, and continuity of treatment until rehabilitation has been achieved, are still as fundamental as they were forty years ago. All that is different are the techniques by which we follow them. Segregation should not negative integration and continuity within a more widely based team.

In the new accident services we need what was essential in the old country orthopædic services—*efficient organisation.*

† Submitted to the annual meeting of the association.

## DIAGNOSIS AND TREATMENT OF ESSENTIAL HYPERTENSION

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(*Concluded from p. 902*)

### Indications for Treatment

SOME think that, to prevent trouble in the future, hypotensive treatment should be undertaken whenever high blood-pressure is found, even if it is mild, symptomless, and uncomplicated. Other say that treatment should be reserved for patients who have developed the accelerated phase (malignant hypertension) or have unequivocal evidence of severe hypertensive disease—e.g., paroxysmal nocturnal dyspnœa or encephalopathy. Others again, like ourselves, feel that treatment should be *considered* whenever there is objective evidence of hypertensive disease, and also in young adult males with considerable diastolic hypertension and a bad family history, and that it should certainly be *instituted* if there is evidence of progression under observation for a short period—e.g., 6–12 months.

We have no reliable estimate of the number of our patients in whom high blood-pressure (160/100 or above) has been discovered but treatment has not been recommended; but our impression is that the proportion of such people in whom treatment is advised is not more than 5–10%. In particular we tend to ignore hypertension in the elderly.

In summary we consider that, other things being equal, strong indications for treatment of hypertension include left ventricular failure or progressive left ventricular hypertrophy, hypertensive encephalopathy or retinopathy, and severe fixed diastolic hypertension in a relatively young man; that moderately strong indications include

a cerebrovascular accident and angina pectoris; that impairment of renal function need not be considered separately because it is always accompanied by other objective changes due to the hypertension; and that contra-indications include considerable renal failure (blood-urea = 100 mg. per 100 ml.), and with certain exceptions, the absence of objective evidence of hypertensive disease.

At the expense of repetition, certain points deserve emphasis when weighing the evidence *against* treatment.

A 13-lead electrocardiogram (i.e., including leads VI–VII) should be recorded in every case and examined for evidence of left ventricular hypertrophy. If there is none, then the probability should be considered that treatment is *not* indicated.

The fundi should be examined through fully dilated pupils and abnormalities in each quadrant noted. If there are none suggestive of hypertension, the probability should be considered that special treatment is *not* indicated.

The blood-urea should be estimated and if above 100 mg. per 100 ml. *only* symptomatic treatment should be given.

Angina pectoris, auricular fibrillation, bundle branch block, mental changes, intermittent claudication, and a predominant increase in systolic blood-pressure serve as warnings that atherosclerosis is probably more important than hypertension and that treatment directed to lowering the blood-pressure should be given with caution or not at all.

If symptoms are present but not accompanied by any objective evidence of secondary hypertensive changes, the probability should be considered that they have some basis other than hypertension.

As explained above, there are occasional exceptions to these statements being taken as contraindications to treatment, but they stand as guiding principles.

### Aims of Treatment

Since the cause of essential hypertension is unknown, and the high blood-pressure itself is believed to be largely responsible for secondary vascular complications, the aim of treatment in suitable cases is to reduce the blood-pressure to as near a normal level as possible, without undue side-effects, and to keep it there. Caution, however, is required where coronary or cerebral atheroma is suspected or where renal function is considerably impaired. In such cases the pressure should be reduced more gradually and to a lesser degree, and great care should be taken to avoid postural symptoms which indicate too great a fall, since this will increase the risk of thrombosis or ischæmia or further impairment of renal function.

### The Hypertensive Clinic

As a rule, the family doctor is not in a position to decide whether treatment is necessary. If errors are to be minimised, this decision requires not only multiple readings of the blood-pressure (including basal and sleeping records), and the exclusion of any underlying cause or associated disease such as atheroma, but also ophthalmoscopy, radiography, electrocardiography, and assessment of renal function. Furthermore it is usually much better that treatment should be started, and if possible stabilised, in hospital.

Some may think this a counsel of perfection, and there are obvious difficulties and disadvantages in referring all patients with hypertension to hospital. But our experience shows that many patients are at present receiving treatment which is inadequate or unnecessary; and if one accepts the fact that hypertension is a potentially serious condition, that treatment is difficult, and that once initiated it should logically be continued for life, then it seems only right that, wherever the patient may live, the best possible arrangements should be made. The more cases one sees, the more one appreciates the difficulties of proper selection and avoidance of error.

In older patients special investigations such as pyelography are rarely indicated, and often only moderate reduction of the blood-pressure is desirable. In general, the younger the patient the more important it is to exclude underlying disease and to treat the hypertension thoroughly.

We have no doubt that the best means of ensuring satisfactory control of a patient with serious hypertensive disease is his attendance at a clinic organised for the purpose. Likewise the blood-pressure records are most likely to be accurate if they are always taken by the same technician—and usually the readings will be lower than a doctor's because the technician is a lesser stimulus for an emotional rise of pressure. In the early days after discharge from hospital a stable regime can be most speedily and safely ensured in a clinic. Though the intervals between visits can gradually be increased, regular attendance gives the patient an opportunity to discuss difficulties and the doctor an opportunity for serial recordings of objective changes in retina, heart, and renal function.

### Choice of Drugs

Opinions vary about the best drug or combination of drugs, and also about their efficacy. One reason for this is that few physicians have the care of many patients with severe hypertensive disease, and, so far, it has been only in such patients that unequivocal evidence of improvement could be obtained. Another reason is that the difficulties of assessing even one drug are so great that no single clinic has been able to gain adequate experience of many different drugs or regimes. Moreover, even those using the same drugs sometimes differ considerably in their reports—partly perhaps because of differences in their selection and management of patients, but partly also because of differences in their outlook and enthusiasm.

Some think a combination of pentolinium and hydralazine (' Apresoline ') so effective that it will reduce blood-pressure to normal in almost all patients: others regard hydrallazine as so toxic that it should rarely be used at all, even in combination. Some say that rauwolfia or reserpine is so safe that it should be given to all patients with hypertension, either alone or in combination: others rate its potential dangers so high that they would reserve it for cases in which other remedies have failed. Some hold that ' Veriloid ' or protoveratrines are useful, especially in association with other drugs: others take the view that the toxic and therapeutic doses of this substance are so close together that it has no place in treatment. Some continue to use hexamethonium whenever a ganglion-blocking drug is required: others abandoned it years ago when pentolinium was introduced. Mecamylamine is probably the ganglion-blocking drug at present most commonly used in Britain; yet we have found its advantages slight.

#### GANGLION-BLOCKING DRUGS

These drugs act by blocking the transmission of nerve impulses through autonomic ganglia, and their usefulness in the treatment of hypertension is now generally accepted. Unfortunately no drug yet produced has a selective action on the sympathetic ganglia, and the consequent blocking of parasympathetic impulses usually causes side-effects in some degree. In our experience it is now never necessary in long-term treatment to give these drugs by injection.

In our clinic thorough trials have been made of hexamethonium, pentolinium, and mecamylamine; but all who have done such work will appreciate the difficulties of judging the relative merits of different preparations all of which are usefully active but none is free from troublesome actions too. Hence a firm opinion is not offered on more recent products.

*Methonium compounds* have now been superseded by better drugs.

*Pentolinium* (' *Ansolysen* ') has considerable advantages over the methonium compounds, and we doubt whether any recent product has material advantages over pentolinium. Given by mouth three times daily, it will reduce the standing blood-pressure in most patients to near-normal levels. It may not achieve this without undue parasympathetic effects, but in some cases its action is made smoother by the concurrent administration of chlorothiazide or one of the rauwolfia compounds. If a patient is reasonably well controlled on pentolinium, it is inadvisable to change to a newer preparation.

*Mecamylamine* (' *Inversine* ').—The opinions we formed after 18 months' use of this drug (Kitchin, Lowther, and Turner 1957) have been confirmed by further experience. Mecamylamine may be a little smoother in action than pentolinium, but parasympathetic side-effects are common and troublesome.

*Chlorisondamine* (' *Ecolid* '); *pentacynium* (' *Presidal* '); *pempidine* (' *Perolysen* ', ' *Tenormal* ').—Our experience with these is relatively limited, but in most cases each has proved effective in reducing the blood-pressure though not without side-effects.

*Recommended Regime*

It is best to start with a single preparation in a small dose given three times daily, and then gradually increase each dose until a significant fall in standing blood-pressure is obtained. Initial tolerance in some degree is usual; but as a rule it can be overcome within a few weeks, though in some cases this takes a few months and occasionally the dose has to be increased from time to time for a long period. Patients should be assured that side-effects such as blurred vision, dry mouth, and constipation will diminish or respond to antidotes. At this stage it is useful from time to time to record the blood-pressure hourly for a day, so as to determine the best amount and timing of each dose. The dose should then be stepped up every 2–3 days; but caution is required as soon as postural symptoms develop, for the dosage may then be critical.

*Pentolinium* (40 mg. and 200 mg. tablets) commenced with 40 mg. three times a day and worked up by increments of 40 mg. to each dose. Average daily maintenance dose = 600 mg.

*Mecamylamine* (5 mg. and 10 mg. tablets) commenced with 2·5 mg. three times a day and worked up by increments of 2·5 mg. to each dose. Average daily maintenance dose = 60 mg.

*Chlorisondamine* (50 mg. tablets) commenced with 25 mg. three times a day and worked up by increments of 25 mg. to each dose. Average daily maintenance dose = 400 mg.

*Pentacynium* (100 mg. tablets) commenced with 50 mg. three times a day and worked up by increments of 50 mg. to each dose. Average daily maintenance dose = 800 mg.

*Pempidine* (5 mg. and 10 mg. tablets) commenced with 2·5 mg. three times a day and worked up by increments of 2·5 mg. to each dose. Average daily maintenance dose = 25 mg.

If this regime is ineffective—failing to reduce the blood-pressure adequately without undue side-effects—the first step should be to add neostigmine. The next should be to reduce the dose of the ganglion-blocking drug and add chlorothiazide. If this fails, the intake of salt should be restricted. Consideration should also be given to the addition of one of the rauwolfia compounds.

*Posture*

Because ganglion-blocking drugs have little if any central action on blood-pressure, they do not influence the degree of hypertension in the horizontal position. That is why the efficacy and dosage of drugs can be judged only from blood-pressures taken when the patient is erect, and why patients should be up and about as much as possible during the day. We formerly followed the recommendation that the head of the bed should be raised on blocks (12–15 in.); but the fall in blood-pressure thus produced is too small to be worth bothering about.

*Side-effects*

Apart from postural hypotension—which is due to excessive dosage—side-effects are mainly the result of parasympathetic blockade. In countering them the first step should be to give a drug which stimulates parasympathetic nerve-endings. Neostigmine is useful and is best given in divided doses at the same time as the ganglion-blocking drug, beginning with half a tablet (7·5 mg.) three times daily and gradually working up. Often a larger dose will be found advisable in the morning, to assist bowel action.

*Blurring of vision* is due to paralysis of accommodation and tends to be most troublesome in the early days of treatment. Improvement may be obtained with eserine (0·5–1%) or pilocarpine (1%) drops, or with the two together. If this is insufficient, slip-on lenses may be tried; if they are effective and the difficulty persists, permanent spectacles can be prescribed.

*Dry mouth* rarely persists to a troublesome degree. Sucking sweets may help. Pilocarpine pills, gr. $^1/_{12}$, are effective and can be taken as required.

*Distension with constipation* is a common and important side-effect which must be controlled lest paralytic ileus follow. If neostigmine is not effective enough, regular doses of a laxative—sufficient to produce a daily motion without diarrhœa—may be necessary.

*Diarrhœa.*—With some patients, usually but not always following constipation, and most often with mecamylamine, diarrhœa may be troublesome and difficult to overcome. The dosage of the ganglion-blocking drug should be reduced, after which it can be gradually increased again and a chalk mixture given.

*Retention of urine* may occur, especially in middle-aged males, or else delay in emptying the bladder, but this tends to pass off. Neostigmine is of value and may be effective by mouth. Carbachol is also useful.

*Impotence* may be a troublesome but unavoidable price to pay for adequate control of the blood-pressure.

*Cessation of Treatment*

There is good reason to believe that abrupt cessation of treatment, with a consequent sudden rise in blood-pressure, may be dangerous—the overshoot resulting in intracranial hæmorrhage. Hence all patients should be warned not to run out of tablets or to stop taking them for any reason. If side-effects occur, they should lower the dose and report for advice.

*Emergency Treatment*

The need to lower the blood-pressure is seldom urgent. Although acute left ventricular failure may respond to an injection of a ganglion-blocking drug, there is no evidence that this is better than the customary injection of morphine, followed by a diuretic. Indeed our impression is that it is not so good.

### CHLOROTHIAZIDE

Quite apart from its value as a diuretic, chlorothiazide (' Saluric ') has great promise as an adjuvant to the treatment of hypertension. It enhances the effect of ganglion-blocking drugs and this allows their dose to be reduced,

with corresponding reduction of side-effects. But caution is required in case severe postural hypotension should result. Our present practice is to halve the dose of the ganglion-blocking drug, add chlorothiazide 250 mg. three times daily, and then gradually increase the dose of the ganglion-blocking drug as required.

The diuretic action of chlorothiazide is useful to patients with cardiac failure, established or incipient. The increase in sodium excretion which it induces has both theoretical and practical advantages. If larger doses are required, a supplement of potassium should be given—e.g., 1 g. of potassium chloride with each 0·5 g. tablet of chlorothiazide.

#### RAUWOLFIA

Rauwolfia alkaloids have a central inhibitory action, particularly on the brain-stem, and produce a fall of blood-pressure, bradycardia, and sedation.

They are often given with ganglion-blocking drugs so that the dose of the latter may be reduced and side-effects lessened. But we have been surprised to find that, when a patient has been stabilised on such a combined regime for some months, rauwolfia compounds can often be omitted without any rise in blood-pressure or a return of side-effects.

Some regard rauwolfia as suitable for all patients with hypertension, and especially for mild cases, saying that toxic effects are rare. But in our view patients with mild hypertension should not be treated at all. Particularly with reserpine, side-effects are common: they may include fatigue, drowsiness, nasal congestion, nightmares, diarrhœa, paræsthesiæ, œdema, extrasystoles, parkinsonism, fainting, giddiness, flushing, agitation, and depression. The depression can be serious, and these drugs carry a real risk for some patients. Many cases of severe depression have been reported and more have occurred. Not a few lives have been lost.

In our experience, the hypotensive action of rauwolfia compounds is so mild that only a small proportion of patients—perhaps exceptionally sensitive to the drug—get any benefit when it is used by itself. In many it has no appreciable effect on the blood-pressure and in these it should be stopped. Probably many physicians are unconsciously prescribing the drug as a placebo. Given alone, it will be effective chiefly in nervous people with labile hypertension who require a sedative.

#### HYDRALLAZINE

Hydrallazine (apresoline) has central and peripheral but not ganglion-blocking actions. It is unique among hypotensive drugs in increasing cardiac output and at the same time lowering blood-pressure. In our experience the toxic effects of hydrallazine were so frequent and so severe that treatment usually had to be abandoned (Harris and Turner 1954).

They included headache, nausea, flushing, nasal congestion, angina, œdema, rashes, fever, joint pains, and general misery. Those who have persisted with large doses have described a syndrome resembling disseminated lupus in about 10% of cases. When hydrallazine is given with a ganglion-blocking drug, toxic effects are still common but less severe. Some workers have claimed consistently good results if the patient can be persuaded to continue treatment until side-effects decrease, but most physicians have found other drugs more satisfactory.

In our opinion the only place for hydrallazine is in association with a ganglion-blocking drug in cases where renal function is impaired and one is anxious to avoid further depression of renal blood-flow. We have no really convincing evidence that this is effective.

#### VERILOID AND PROTOVERATRINES

These drugs have a central action and block afferent reflex impulses. The effective therapeutic and toxic doses are close together, and with subemetic doses tolerance soon develops. They are of little value in treatment.

#### HYDERGINE

In recent years Swiss and German workers have made hopeful claims for ' Hydergine ', which is a mixture of dihydrogenated compounds of ergot and has a central sympathetic inhibitory action. These claims have not been substantiated elsewhere, and the general view, with which we concur, is that the hypotensive action of hydergine is too mild to be useful.

### Hypotensive Drugs and Wellbeing

As a rule, patients with essential hypertension do not feel ill. They may complain of symptoms, for whose relief they are grateful (e.g., headaches, visual disturbances, angina, or dyspnœa), but their general health is usually unaffected. By contrast, patients under treatment with any of the modern hypotensive drugs do *not* feel well—quite apart from specific side-effects such as a dry mouth or postural hypotension. When, for any reason, treatment has to be stopped, or they run out of drugs, they commonly feel better; and this is one of a number of reasons why we do not advise treatment for patients with mild hypertension. Some patients of nervous or neurotic temperament are so intolerant of side-effects that treatment must be abandoned.

### Conclusion on Hypotensive Drugs

With patience and perseverance, satisfactory control of the blood-pressure can be obtained in most patients who require treatment, and undoubted benefit will follow.

On the criteria discussed one has to decide whether the treatment should be *vigorous* (aiming at as much control over the blood-pressure as side-effects will allow), *gentle* (aiming at moderate control, which will prevent reduction in blood-flow to heart, brain, or kidneys), or merely *symptomatic*, which may or may not include some lowering of the blood-pressure.

Experience should be gained with one ganglion-blocking drug, one rauwolfia compound, and chlorothiazide. When new drugs appear and get favourable reports from those who have the opportunity to make comparative studies, they may be tried in patients whose regime is proving unsatisfactory.

### Surgical Treatment

*Sympathectomy*

Surgical sympathectomy involves two major operations, each with some risk to life or health, and does not affect the underlying cause of hypertension. Often the blood-pressure is lowered only temporarily, and hardly more than by almost any operation, or it gradually rises again to former levels. Often it has been performed, unnecessarily, to prevent possible complications in later life, and some patients have died prematurely as a result. On the other hand, it does relieve symptoms, and in some cases of severe hypertensive disease it has achieved remarkable results and apparent cure. Some patients have been spared the many difficulties of long-continued medical treatment, while in others this has been made easier and more effective.

In our opinion surgical sympathectomy is indicated only when the blood-pressure cannot be controlled satis-

factorily by medical treatment, and in our experience symptoms can usually be relieved equally well by gentler medical means. No patient, we would say, should be subjected to surgery until a reasonable though not unduly prolonged trial of medical treatment has been carried out. If hypotensive drugs fail, surgical treatment should be advised as an adjuvant to medical management. An occasional exception is in patients who are unlikely to cooperate in medical treatment or whose circumstances are such that careful observation is impracticable.

The procedure most commonly employed is thoracolumbar sympathectomy as recommended by Smithwick, of Boston.

*Adrenalectomy*

There has been revival of interest in adrenalectomy, and the evidence suggests that, when surgical treatment for hypertension is considered necessary, adrenalectomy (complete or partial) with or without sympathectomy is the best procedure. Our practice in such cases has been to advise total bilateral adrenalectomy and bilateral lumbar-dorsal sympathectomy as a two-stage procedure. However, these operations are now rarely needed: in fact it is now more than three years since any patient in our clinic has had surgical treatment.

## General Management

Enthusiasm for the administration of hypotensive drugs sometimes leads to the neglect of general management. Each patient must be considered in relation to his personality and environment as well as in relation to the prognosis without treatment. Judgment is based on a balance of probabilities. Explanation and reassurance should be given in accordance with the patient's degree of insight. Advice as regards work and play, rest and exercise, diet and smoking really amounts to recommending moderation in all things.

Exercise short of producing symptoms is beneficial, but a heavy occupation is unwise. Delegation of responsibility should be encouraged. A smaller income and less ambition may be necessary. There may be a price to pay for health, but it is worth paying.

*Diet*

Patients with hypertension who are overweight feel better when they lose weight. Not only has the heart less work in maintaining the circulation on exertion, but loss of weight often results in some lowering of blood-pressure though this is rarely considerable. (The effect of varying arm size when the blood-pressure is recorded with a cuff of standard width must be remembered.)

There is no reason to think that a reduction of protein intake has any effect on the blood-pressure, but there is suggestive evidence that a reduction in the intake of animal fat, and the taking of vegetable fat (e.g., corn oil), may reduce the development of atheroma.

*Salt*

Sodium is in some way related to the regulation of blood-pressure, though the mechanism is obscure. A low intake of sodium—i.e., less than 1 g. daily—will reduce the blood-pressure, and reduce retinopathy, in most patients with hypertension; but the necessary restriction in salt intake makes this regime intolerable for most people and we do not recommend it. Moderate restriction of salt intake does not reduce the blood-pressure (owing to adaptation of excretion by the kidney); but it probably potentiates the action of hypotensive drugs and the effect of sympathectomy. Certainly restriction of salt facilitates the management of cardiac failure in those who require digitalis and diuretics.

In patients with renal failure severe restriction of salt may be dangerous, and the "low salt syndrome" is liable to appear especially in those who are also having frequent diuretics.

Patients who are liable to develop hypertensive cardiac failure later will do well to restrict their use of added salt at table and in cooking: this is good practice for the day when they will have to do so. In patients who are not responsive to hypotensive drugs, salt restriction should always be tried.

*Smoking*

The only advantage of smoking tobacco is satisfaction of the craving which develops in those who are addicted to this drug. It has been shown to have adverse effects on the cardiovascular system, and these include a rise of blood-pressure.

## Hypertension in the Elderly

Age is not in itself a contraindication to treatment; but, except for the relief of symptoms, hypertension needs treatment less often in old people than in younger ones. In general, the prognosis in the elderly is relatively good, and at this time of life the presence of left ventricular hypertrophy or retinal changes (short of papillœdema or exudates) is no longer a reason for treatment. Hypertensive cardiac failure *is* an indication; but, because it is so often associated with coronary atheroma, the pressure should be lowered cautiously for fear of precipitating myocardial ischæmia. Caution is likewise required in those with evidence of cerebral atheroma. However, in some patients recovering from a vascular accident, preservation of alertness, memory, concentration, and emotional stability suggests the absence of diffuse atheroma; and if they show other signs of hypertensive disease (e.g., in the fundus or electrocardiogram) gentle reduction of blood-pressure—short of producing postural symptoms—is advisable.

## Difficulties in Treatment

Difficulties fall into two main groups—those of the patient and those of the physician. From the patient's standpoint the assessment of drug treatment is slow, and usually involves admission to hospital. However much care and attention is given to the psychological handling of these people, and despite assurance that the height of the blood-pressure, though the only available guide to dosage, is not in itself of much importance, the frequent recording of pressures inevitably leads to introspection. Moreover, as already pointed out, patients on hypotensive drugs may lose their hypertensive symptoms, but most of them feel less well.

The physician for his part finds the assessment is time-consuming and beset with difficulties. With or without treatment, the blood-pressure varies unpredictably from hour to hour and from day to day—with meals and with moods, with personal worries or changes of environment. Tolerance requiring higher dosage, or intolerance requiring lower dosage, are common. Alarming symptoms may develop without warning. And all the while, with many patients, the physician feels not quite certain whether it is all worth while—whether in fact the patient's life is going to be prolonged and made more tolerable, or whether it

would not be better to give him a sedative or placebo, impose few restrictions and allow him to live more freely, with the prospect of death a little earlier, in the saddle, rather than a little later, in bed or armchair.

### Treatment and Prophylaxis

Although the proportion of patients who have died as a direct result of treatment is small, the absolute number is considerable; and such an event is particularly tragic when the outlook without treatment would have been reasonably good. Deaths have followed paralytic ileus, irreversible hypotension, myocardial infarction, hemiplegia, and severe depression. Besides the many published reports of serious or fatal toxic reactions, many more cases have gone unreported.

Hence the doctor who initiates treatment takes a heavy responsibility; and, if it is to be given at all, the treatment must be good. This means much attention to detail under the supervision of someone thoroughly familiar with all aspects of the problem—with the natural history of high blood-pressure and hypertensive cardiovascular disease; with retinoscopy, radiography, electrocardiography, the assessment of renal function and so on; with the actions, side-effects, and toxic effects of drugs; with the indications and contraindications for surgery; and with the medical management of patients before, during and after operation.

Though this sounds difficult, it is in fact perfectly possible for an individual physician working in hospital to do all that is necessary to assess the patient's condition and establish control, after which the general practitioner can continue treatment in consultation with him. Admittedly in some districts this is awkward, but if the patient is ill enough to need treatment at all he can almost always be referred to an appropriate centre; while if there is doubt about the advisability of treatment, detailed assessment before coming to a decision is important. In my view, the practitioner should not himself initiate treatment, except perhaps for elderly patients in whom special investigations would be out of place because their results would be unlikely to modify therapy. In all cases, the patient should be kept under close observation.

The dilemma facing physicians is this. For obvious reasons, the treatment of hypertensive disease should begin before this becomes severe: indeed, one might say that, ideally, hypertensive disease should be prevented by the early treatment of all those in whom high blood-pressure is found. But though we may reasonably assume that prophylaxis with hypotensive drugs is efficacious, there is as yet no proof that it is; and none of the drugs available are wholly satisfactory. Their use has many attendant disadvantages to which at present many patients with mild hypertension are being unnecessarily exposed.

In practice what seems sensible is to keep candidates for hypertensive disease under observation so as to detect early manifestations of deterioration, and to keep mild hypertensives under observation so as to estimate the rate of progression and the probable prognosis without treatment. Without a sufficient period of observation the rate of progression cannot be judged: especially in the middle-aged or elderly it is sometimes very slow.

After initial assessment and the exclusion of secondary hypertension, arrangements should be made for the periodic review of all cases in which observation without treatment is decided on. At intervals of, say, 6 months the patient should be asked about relevant symptoms such as headache, angina, dyspnœa, visual disturbances, or nocturia; and he should have a general physical examination, with examination of the retina and urine. An electrocardiogram every 12 months will detect any important degree of left ventricular hypertrophy. The blood-pressure should, of course, be recorded; but comparatively little importance can be attached to casual readings, and in most cases the blood-pressure is not the best guide to deterioration. Even in patients with hypertensive disease, the blood-pressure rarely shows a progressive increase but tends rather to stay at about the same level despite the signs of cardiovascular deterioration.

### Summary

Many patients with hypertension are receiving treatment which is unnecessary and many others treatment which is inadequate. Logically, once begun, treatment should be continued indefinitely.

At present no satisfactory hypotensive drug is available. Most patients notice undesirable side-effects and few feel really well while taking the drugs. Hence treatment is a life sentence that should not be lightly imposed.

On the other hand, by means of these drugs, symptoms can often be relieved, retinopathy cleared, left ventricular hypertrophy reduced, recurrence of cardiac failure postponed, and life prolonged.

All patients should first be admitted to hospital for detailed assessment, and, if they require treatment, a stable regime should be established before discharge. Thereafter treatment should be supervised by the practitioner in conjunction with the hospital clinic.

In many patients with a raised blood-pressure, associated atherosclerosis is the more important condition. In such cases the blood-pressure should be lowered only moderately, or not at all, and it is important to avoid postural hypotension.

Except in relatively young men, treatment is rarely indicated for high blood-pressure unless, in addition to considerable diastolic hypertension, there is evidence of hypertensive disease—i.e., objective signs of secondary changes in the retinæ or heart.

Of the ganglion-blocking drugs studied (pentolinium, mecamylamine, chlorisondamine, pentacynium, and pempidine) none has a material advantage over the others. Each has undesirable side-effects from parasympathetic blockade.

Used by themselves, or in conjunction with ganglion-blocking drugs, rauwolfia and its derivatives have proved unsatisfactory as hypotensive agents. In most cases their action is too mild.

Chlorothiazide is a drug of great promise as an adjuvant. Caution is required to prevent undue postural hypotension.

I am grateful to a succession of senior registrars, in particular Dr. C. P. Lowther and Dr. A. H. Kitchin; to Sister C. MacGregor who sustained the morale of most of the patients; to Miss Sheila Crawford who recorded most of the electrocardiograms; and to Miss Norma Millar who recorded most of the blood-pressures.

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# THE MANAGEMENT OF THE ACUTE WITHDRAWAL PHASE IN ALCOHOLISM

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THE alcoholic in an acute toxic state following prolonged excess is an unpleasantly familiar problem. We have been unfavourably impressed by the frequently vague and haphazard treatment of such cases in general hospitals, and even in specialised centres.

Standard textbooks tend to dismiss the management of the acute toxic withdrawal phase with references to small doses of insulin, paraldehyde sedation, and the use of concentrated vitamins (Mayer-Gross et al. 1954, Sargant and Slater 1954, Brain 1955, Cecil and Loeb 1955, Henderson and Gillespie 1955, Price 1956). The current literature of the subject varies widely in its approach, and there is what appears to us a mistaken preoccupation with single therapeutic agents such as chlorpromazine (Sainz 1957), promazine (Figurelli 1956), corticotrophin (Smith 1950), reserpine (Avol and Vogel 1955, Carey 1955), and vitamins (Armstrong and Gould 1955).

Most alcoholics present themselves for treatment only when drinking has become a pressing problem through extreme excess, when trauma or infection has supervened, or when long-continued indulgence has dangerously undermined health. Any uncertainty or hesitation in instituting effective treatment at this critical point may result in dangerous or even fatal complications, such as delirium tremens, status epilepticus, or pneumonia. It may be valuable, therefore, if we describe a regime which we have found effective.

*Development of Method*

It was first used in this hospital early in 1955.

For withdrawal symptoms preliminary American reports (Cummins and Friend 1954, Aivazien 1955, Mitchell 1955, Schultz et al. 1955) had emphasised the advantages of chlorpromazine over the more established forms of sedation. We were impressed by its effectiveness, but we found that it gave still more favourable results if combined with a barbiturate.

The importance of vitamins in cerebral metabolism had become increasingly evident and Gould (Gould 1953, 1954, Armstrong and Gould 1955) had demonstrated that patients in toxic states responded to large doses of the B group with vitamin C. When a highly concentrated vitamin preparation for intravenous administration (' Parentrovite ': 20 ml. contains $B_1$ 500 mg., $B_2$ 8 mg., nicotinamide 380 mg., pyridoxine 100 mg., calcium pantothenate 10 mg., dextrose 2 g., and ascorbic acid 1000 mg.) became available we tried it by itself and in conjunction with chlorpromazine and barbiturates. The results obtained with the combination were much better than those achieved using the vitamin preparation by itself.

This tentative approach led to the evolution of a well-defined regime which has remained essentially unaltered for the past 3 years. As the use of chlorpromazine was followed by jaundice in two cases, and as there was often severe pain at the site of its injection, a more recent phenothiazine derivative (promazine, ' Sparine ') has been used instead. This is apparently free of these disadvantages (Fazekas et al. 1956, Mitchell 1956).

This method has now been employed in the management of three hundred and thirteen alcoholics suffering from severe withdrawal symptoms.

## Method

A careful history is taken from a relative or friend and a physical examination of the patient is made. No alcohol is given after admission to hospital.

*First 24 hours*

An initial injection of promazine 100 mg. and pentobarbitone gr. 4 is administered by the deep-intramuscular route into the buttock using separate syringes and needles (because mixture of these drugs causes precipitation). Following this, parentrovite 20 ml. is injected intravenously. These do not normally take effect for about 30 min., and during this period the patient is encouraged to eat a light meal with liberal fluids. In view of the deep sedation normally produced, antibiotic cover is given as a routine, usually as crystalline penicillin 500,000 units intramuscularly.

Injections of pentobarbitone, promazine, and penicillin similar to the first are repeated after 8 and 16 hours, making three injections in all. The patient is kept propped up by pillows and is roused 4-hourly. Fluids are encouraged, to achieve a total intake of 2·5 litres in 24 hours.

*Second 24 hours*

Clinical improvement should now be definite, and intramuscular sedation is stopped. Pentobarbitone gr. 3 and promazine 100 mg. are continued by mouth thrice daily. Antibiotics are now discontinued and a further intravenous injection of parentrovite 20 ml. is given. The patient is allowed to sit up and is permitted to visit the toilet. He is encouraged to take a light and nourishing diet. Should sedation at night be necessary an additional gr. 3 of pentobarbitone is given.

*Third 24 hours*

On the morning of the 3rd day the patient is usually anxious to be allowed up. He is encouraged to undertake light tasks about the ward and to mix with the other patients. Sedation is further reduced to sodium amylobarbitone gr. 1 and promazine 50 mg. t.d.s. Parentrovite 20 ml. intravenously is given.

*Fourth 24 hours*

The patient is permitted to take part in all ward activities and to engage in occupational therapy. No more barbiturates are given and the dose of promazine is reduced to 25 mg. t.d.s. A concentrated vitamin preparation by mouth is substituted for the intravenous preparation (we use ' Omnivite ' two tablets t.d.s.) and the patient is now ready for more specific treatment of his alcoholism. Promazine is discontinued after another day, while vitamin therapy is continued for 7 or 10 days.

The regime described above is adequate for the severe and chronic alcoholic, but occasionally one may meet a patient in whom infection of the respiratory tract, trauma, or mental and physical exhaustion has supervened. This situation may be followed by the appearance of alcoholic hallucinosis, toxic confusion, delirium tremens, or epileptiform convulsions. During the most dangerous period, 36–48 hours after admission, particular care should be taken, and the routine may be modified as follows:

1. The usual 24-hour period of intramuscular sedation is extended to 48 hours.

2. Parentrovite 20 ml. is given intravenously 12-hourly instead of 24-hourly.

3. Antibiotic cover is continued for 72 hours or longer, and if necessary is modified to deal with the particular infecting organism.

4. Corticotrophin 25 I.U. 8-hourly is given intramuscularly if alcoholic hallucinosis, toxic confusion, or delirium tremens has supervened. This is normally continued for 36 hours and then the dosage is gradually reduced.

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In the present series we admitted twelve such complicated cases. Ten were suffering from delirium tremens, one from status epilepticus, and one from lobar pneumonia. A further ten cases became complicated during the first 72 hours after admission. Six developed lobar pneumonia, three delirium tremens, and one major epileptic attacks.

### Discussion

The physiological mechanisms underlying alcoholic withdrawal symptoms have not yet been fully determined, although several have been implicated. Thus the combustion of carbohydrate by the brain may be impaired because of the deficiency of vitamins which are essential coenzymes in cerebral metabolism (Gould 1953, Armstrong and Gould 1955). There may be sudden failure of a partially successful abnormal pattern of cerebral metabolism which depends on the combustion of alcohol (Armstrong and Gould 1955). A further possibility is a sudden increase of cerebral irritation to critical levels. Our therapeutic approach has a twofold aim:

(*a*) The restoration of normal cerebral metabolism by administering concentrated vitamins (with particular emphasis on the B group and vitamin C) and giving a rapidly utilised carbohydrate.

(*b*) The control of cerebral irritation by adequate sedation.

The use of corticotrophin is based on the hypothesis that delirium tremens is similar biochemically to addisonian crisis and is an expression of adrenocortical exhaustion in response to continued stress (Smith 1950).

Our regime makes the withdrawal phase smooth and rapid and entails the minimum risk and discomfort to the patient. On the 4th day after admission he is ambulant, non-toxic and fit for psychological therapy.

Our ten cases who were admitted in delirium tremens had all been suffering from this condition for 24 to 72 hours before admission. All responded well to the modified system of treatment (within 24 hours in most cases) and all were ambulant on the 4th day after admission. The three cases which developed delirium tremens in hospital did equally well. Five of the six cases of pneumonia occurred during the period before the administration of penicillin during the first 24 hours was made a routine procedure; all cleared up uneventfully with antibiotics.

It is noteworthy that of the three hundred and thirteen cases treated we admitted only ten who developed complications and none of these complications proved serious. Twenty-one out of the total of twenty-two cases considered to be complicated were ambulant on or before the 6th day after admission.

We have also found this regime very effective in the management of withdrawal symptoms in pethidine and morphine addiction but our series of cases is small.

### Summary

We have treated three hundred and thirteen cases of acute alcoholic withdrawal symptoms using a method which is reasonably simple, safe, and satisfactory. The emphasis of our regime is on sedation with chlorpromazine and barbiturates, and large doses of a concentrated vitamin preparation: antibiotics are also given at first. Twenty-two of our cases were complicated by pneumonia, delirium tremens, or epilepsy, but our regime can be modified to deal with these, and none of the complications proved serious.

*References at foot of next column*

## OBSTRUCTIVE AIRWAY DISEASE

### MEASUREMENTS OF EFFORT INTOLERANCE AND FORCED EXPIRATORY VOLUME IN BRONCHITIS, EMPHYSEMA, AND ASTHMA

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THE effort breathlessness of patients suffering from chronic bronchitis, emphysema, or asthma is related to their airway obstruction. A simple measure of the severity of this obstruction is the one-second forced expiratory volume (F.E.V.)—the volume of air expelled in the first second of a forced expiration following a full inspiration. As the obstruction increases, so the volume falls (Tiffneau et al. 1949, Gaensler 1951, Cherniac 1956, McKerrow et al. 1958). We have tried to demonstrate a proportional relation between the effort tolerance and the F.E.V. of patients with such obstruction and to assess its significance.

### Material, Methods, and Results

362 patients, of whom 66 were women, were selected from the outpatient clinics, the wards and breathing-exercise classes of the hospital. All complained of one or more of the following symptoms: effort breathlessness, cough, expectoration, and wheeze. In none was it possible to explain these symptoms by any disease other than chronic bronchitis, chronic bronchitis and emphysema, or asthma, and as a rule we could not distinguish these diseases from each other with confidence. Our male controls were 34 ambulance drivers, and our female controls 10 hospital domestic workers.

The effort intolerance of patients was graded by one of us according to their answers to simple standard questions. Six grades were first used; but since some grades showed similar relation to the F.E.V., they were amalgamated into the following three:

*Mild.*—Patients unable to hurry up hills or stairs, or unable to hurry on the level. Patients with productive cough but only slight effort breathlessness also included.

*Moderate.*—Patients unable to walk as fast as others on the level.

*Severe.*—Patients unable to walk a hundred yards, or for two or three minutes, slowly on the level.

These grades and their resemblance to Fletcher's (1952) dyspnœa grades were discussed in a previous paper (Capel and Smart 1958).

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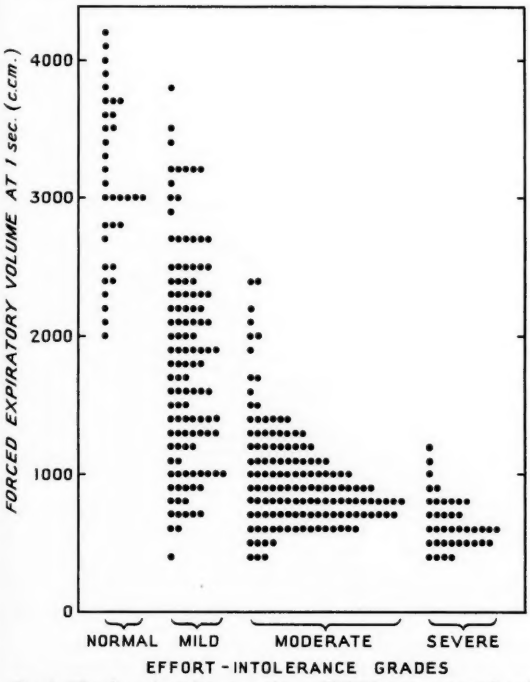


**Fig. 1—The forced expiratory volume (F.E.V.) at one second and effort-intolerance grades in 296 male patients.**

The F.E.V. of each patient was measured as described in that paper. The relationship between effort tolerance and F.E.V. is shown in figs. 1 and 2.

Differences in the F.E.V. due to age and height may be allowed for by expressing the F.E.V. as a percentage of the vital capacity expected for a healthy person of the same age and height (Gaensler 1951). The average F.E.V. percentages for each effort-intolerance grade are shown in figs. 3 and 4. They were calculated from the normal standards of Needham et al. (1954).

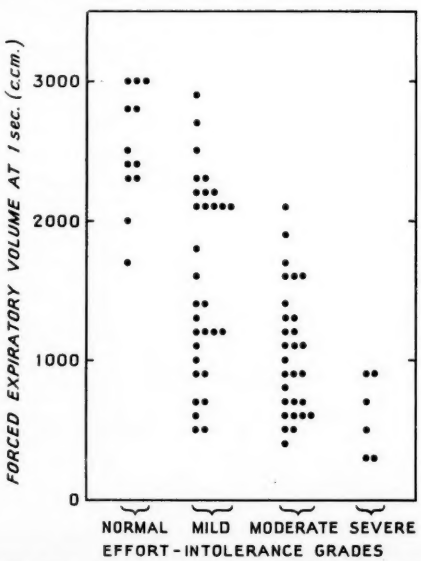


**Fig. 2—The F.E.V. at one second and effort-intolerance grades in 66 female patients.**

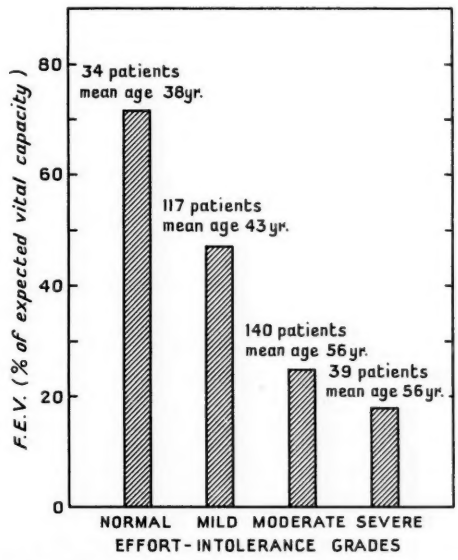


**Fig. 3—The F.E.V. expressed as a percentage of the vital capacity expected for healthy subjects of the same age and height (F.E.V. %) and related to graded effort intolerance. Mean values of 296 male patients.**

## Discussion

Our patients with obstructive airway disease show a fairly close correlation between effort intolerance and the F.E.V.; and from this we infer that the degree of effort intolerance is related to the severity of airway obstruction. The effect of age and height on the F.E.V. is small compared with the effect of obstructive airway disease.

The scatter diagram shows a number of mildly disabled men with a low F.E.V. Some were young and thought to be asthmatics but with no permanent lung damage.

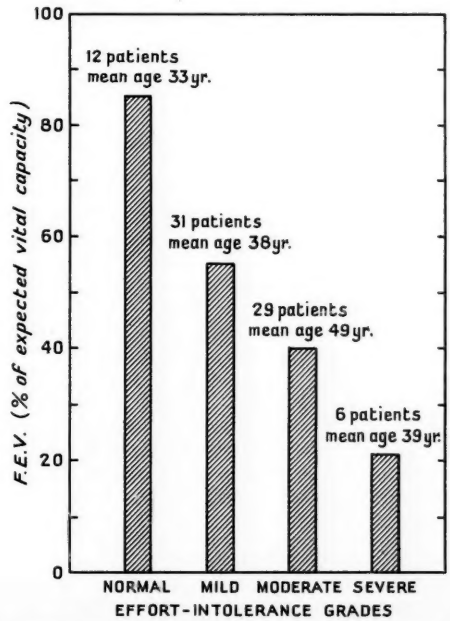


**Fig. 4—The F.E.V. % related to graded effort intolerance in 66 female patients.**

Some were older, with chronic bronchitis and emphysema, who were more disabled when seen between one and two years later. The mean F.E.V. percentage of our apparently healthy ambulance drivers (fig. 3) is a little lower than that usually reported for healthy men (Pemberton and Flanagan 1956).

When obstructive airway disease prevents a man from keeping pace with his fellows he has already lost about two-thirds of his expected F.E.V. If he now loses but another tenth of his expected F.E.V., he may not be able to walk slowly on level ground for more than a few minutes without pausing for breath. Our findings point to the grave loss of respiratory reserve suffered by patients with chronic bronchitis and emphysema by the time they complain of more than mild effort intolerance.


### Summary

A proportional relationship between effort tolerance and the one-second forced expiratory volume (F.E.V.) was found in 362 patients suffering from chronic bronchitis and emphysema or asthma. Intolerance of effort appears to be proportional to obstruction of the airway.

The findings suggest that men with chronic bronchitis and emphysema who complain of more than mild effort intolerance have already lost a large proportion of their respiratory reserve.



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## EFFECT OF QUINIDINE AND TRANQUILLISING AGENTS ON ECTOPIC VENTRICULAR TACHYCARDIA

### RESULTING FROM ACUTE MYOCARDIAL INFARCTION IN THE DOG


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WE have shown previously (Arora 1958, Arora and Sharma 1958) that in experimental cardiac arrhythmias the normal action of the heart can be restored by some of the tranquillising drugs. Against ectopic ventricular tachycardia resulting from acute myocardial infarction in the dog, benactyzine, alseroxylon (' Rauwiloid '), and chlorpromazine were found superior to quinidine, while meprobamate was as effective as quinidine.

In view of the psychosomatic background of cardiac arrhythmias (Katz and Pick 1956), we decided to extend this work. We studied the results of the combined use of quinidine with tranquillising agents on these experimental arrythmias, hoping that, as quinidine and the tranquillisers differ in their mode and/or site of action, they might have a synergistic effect.

### Materials and Methods

The anterior descending branch of the left coronary artery was ligated in two stages, as described by Harris (1950).

Mongrel dogs of both sexes (10 to 22 kg.) were anæsthetised with pentobarbitone 30 mg. per kg. Under artificial respiration, the anterior descending branch of the left coronary artery was exposed via a small incision in the left fourth intercostal space. The artery was freed from connective tissue and accompanying veins for a few millimetres at a level of 2 to 5 mm. distal to the margin of the left auricular appendage. A doubled ligature was passed under the artery and divided. One of the ligatures was then tied snugly but not tightly around the artery together with a no. 20 hypodermic needle. The needle was withdrawn immediately, leaving the artery constricted, but not closed. The second ligature was tightened 30 min. later, totally occluding the artery. The chest wound was closed in layers and natural respiration restored.

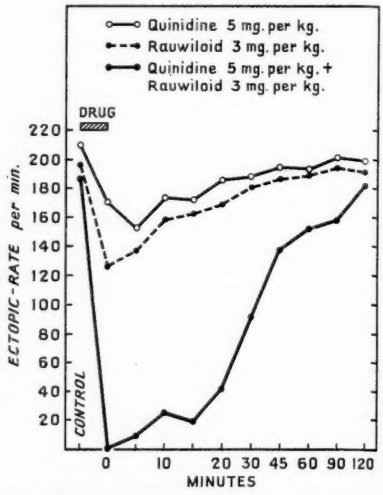


**Fig. 1—Comparative effectiveness of quinidine, benactyzine, and a mixture of quinidine and benactyzine in ventricular tachycardia resulting from acute myocardial infarction in the dog.**

Note the potentiative synergism with quinidine-benactyzine mixture. Each graph represents results from a different animal.

The drugs were given to unanæsthetised animals, 18 to 24 hours after the operation, when their electrocardiograms indicated complete dissociation of atrial and ventricular activity, with at least 75% of beats ventricular in origin.

1% solutions of quinidine, benactyzine, alseroxylon, reserpine, and meprobamate were used throughout.

The test compounds were mixed together in the same syringe (dosages 1 to 10 mg. per kg.) and diluted in 20 ml. of physiological saline. They were administered intravenously through an indwelling venous catheter over a period of 5 minutes. This infusion was repeated after 30 min., if necessary. Electrocardiograms (lead II) were recorded with a 'Galileo' 4-channel ink-writing electrocardiograph.

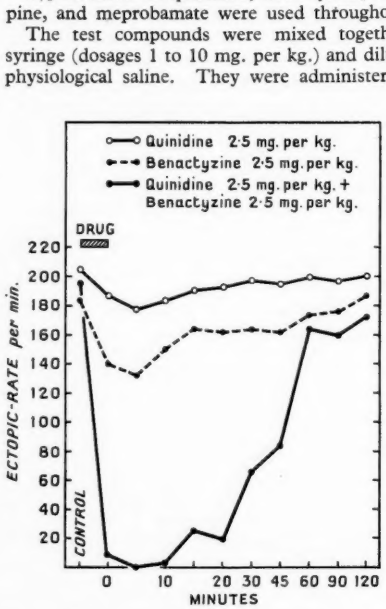


**Fig. 2—Comparative effectiveness of quinidine, alseroxylon, and a mixture of quinidine and alseroxylon in the dog.**

Note the potentiative synergism with quinidine-alseroxylon mixture. Each graph represents results from a different animal.

### Results

A drug mixture was considered effective if it reduced the ectopic-rate by more than half and maintained this reduction for more than 15 minutes.

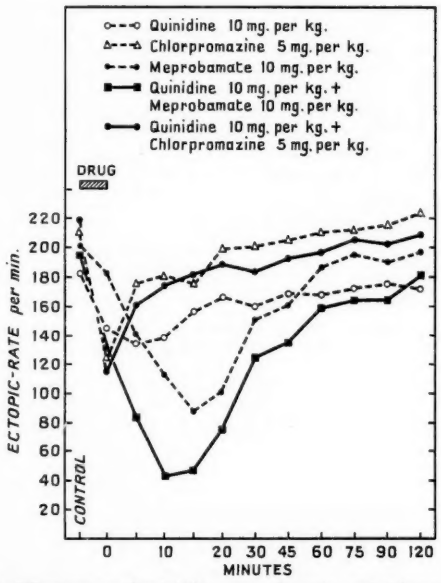


**Fig. 3—Effectiveness of quinidine, meprobamate, and chlorpromazine when administered singly and mixed with quinidine.**

Quinidine-meprobamate mixture produced an additive synergism. No such synergism was noticeable with quinidine-chlorpromazine combination. Each graph represents results from a different animal.

The responses to mixtures of quinidine with benactyzine (fig. 1) and to quinidine with alseroxylon (fig. 2) were more than the algebraic sum of the responses obtained with the drugs individually. This indicates a potentiative synergism.

The response obtained with a mixture of quinidine and meprobamate was almost equal to the algebraic sum of their individual responses. This indicates an additive synergism (fig. 3).

No synergistic response was noticed with the quinidine-chlorpromazine mixture (fig. 3). In the quinidine-reserpine mixture, reserpine (1 mg. per kg.) was found to antagonise the action of quinidine (10 mg. per kg.).

The reduction in the ectopic-rate produced by these drugs individually and with quinidine is shown in the table.

EFFECT OF DRUGS IN VENTRICULAR TACHYCARDIA

| No. of experiments | Drug | Dose in mg. per kg. | Maximum reduction of ectopic beats (%) |
|---|---|---|---|
| 6 | Quinidine | 2·5 | 14·0 |
| 6 | Benactyzine | 2·5 | 17·8 |
| 10 | Quinidine + Benactyzine | 2·5 + 2·5 | 100·0* |
| 6 | Quinidine | 5·0 | 24·7 |
| 6 | Alseroxylon | 3·0 | 36·8 |
| 10 | Quinidine + Alseroxylon | 5·0 + 3·0 | 100·0† |
| 6 | Quinidine | 10·0 | 27·9 |
| 6 | Meprobamate | 10·0 | 57·1 |
| 10 | Quinidine + Meprobamate | 10·0 + 10·0 | 79·8‡ |
| 6 | Chlorpromazine | 5·0 | 40·0 |
| 10 | Quinidine + Chlorpromazine | 10·0 + 5·0 | 43·5 |
| 6 | Reserpine | 1·0 | No effect |
| 10 | Quinidine + Reserpine | 10·0 + 1·0 | 7·8 |

* When administered separately, this result was obtained (Arora 1958) with benactyzine (6 mg. per kg.) but not with quinidine (up to 20 mg. per kg.).
† When administered singly, this result was obtained (Arora 1958) with alseroxylon (6 mg. per kg.) but not with quinidine (up to 20 mg. per kg.).
‡ When administered singly, this result was obtained (Arora 1958) with both quinidine (20 mg. per kg.) and meprobamate (20 mg. per kg.).

## Discussion

In dogs two-stage ligation of the anterior descending branch of the left coronary artery (Harris 1950) produces a long-lasting (72–96 hours) ventricular tachycardia. This arrhythmia corresponds in many respects to that seen in patients with acute myocardial infarction, and the results of our experiments appear to correlate closely with the human data (Harris et al. 1951, 1952, Clark and Cumming 1956). The arrhythmia may precipitate ventricular fibrillation (Harris and Guevara Rojas 1943, Harris 1948), but this danger can be lessened by drugs (Harris et al. 1952).

In our experiments both quinidine-benactyzine and quinidine-alseroxylon mixtures were found to show potentiative synergism, while a mixture of quinidine and meprobamate showed an additive synergism. No untoward side-effects of the drugs were noticeable in the unanæsthetised dog. A quinidine-chlorpromazine mixture, however, did not show significant synergistic response, and reserpine actually antagonised the effect of quinidine.

The individual dosages of these drugs when used in combination were much less than their toxic dosages, and we may hope that their synergic action will prove useful in the treatment of cardiac arrhythmias. On the other hand, we cannot yet offer any information on drug mixtures in man.

## Summary

Mixtures of quinidine and tranquillising agents have been tested for their ability to suppress ventricular ectopic beats in dogs. Mixtures of quinidine and benactyzine or alseroxylon (' Rauwiloid ') produced potentiative synergism. No synergism was noted with chlorpromazine and quinidine, and reserpine actually antagonised the action of quinidine.

It is suggested that such mixtures may be of use in treatment of arrhythmias which follow myocardial infarction in man.

Grateful acknowledgment is made to the Indian Council of Medical Research, New Delhi, for their grant in aid of this investigation.

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" . . . The modern hospital is concerned not alone with in-patient care but with the follow-up of patients into their homes, into nursing homes, the use of ' homestead ' plans, out-patient services, the follow-up of chronic diseases, and vocational, educational, physical and mental rehabilitation. The hospital of the future may well be designed primarily to provide community preventive health services for ambulant patients and well people, with in-patient beds an adjunct for the acutely ill and those requiring special diagnostic or treatment facilities and personnel. It is obvious that this concept of the modern hospital is characterized by flexibility and a focus on the functions to be performed rather than on institutional management.—Dr. WILLARD C. RAPPLEYE: Address to Greater Detroit Area Hospital Council, Nov. 18, 1958.

# RATE OF CLEARANCE OF INSULIN LABELLED WITH $^{131}I$ FROM THE SUBCUTANEOUS TISSUES IN NORMAL AND DIABETIC SUBJECTS

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A STUDY of the reactions at the site of insulin injections, in insulin-requiring diabetics, suggested that local disappearance or hypertrophy of fat was sometimes associated with difficulty in controlling the diabetes, and a possible explanation was delay in absorption of insulin with consequent damage to subcutaneous tissues. Others have noticed an association between high insulin dosage, lipodystrophy, and poor control (Root et al. 1944, Lamar 1950, Boulin et al. 1952, Chimenes 1955, 1959). Paley and Scott (1958), however, were unable to distinguish between the hypoglycæmic effects of insulin injected in normal and dystrophic areas.

Absorption from subcutaneous depots has been studied in laboratory animals (Beecher and Krogh 1936, Lang and Reiner 1941, Reiner et al. 1942, 1943). Using labelled insulin, Root et al. (1944) examined absorption from subcutaneous tissues in human subjects, but some doubt exists about the biological validity of the labelled compound produced (insulin-4-iodoazobenzene).

TABLE I—MEAN HALF-PERIOD OF INSULIN LABELLED WITH $^{131}I$ IN ARM, LEG, AND ABDOMEN IN NORMAL MALE AND FEMALE SUBJECTS

| Site | No. | Male half-period (min.) | No. | Female half-period (min.) |
|---|---|---|---|---|
| Arm .. .. .. | 10 | 67±11* | 12 | 55±7 |
| Leg .. .. .. | 10 | 123±18 | 10 | 99±12 |
| Abdomen .. .. | 9 | 76±20 | 6 | 76±20 |

* 95% confidence interval.

## Materials and Method

The studies recorded here were made on 59 male and 38 female control subjects, chiefly doctors and students, and upon 24 male and 17 female diabetic patients. Pure crystalline insulin [1] was labelled with $^{131}I$ by Pearson's (1959) method. The product contained no freely diffusible $^{131}I$ and no loss in its biological activity or immunological reactions could be detected in assay by the rat-diaphragm technique (Wright 1959).

TABLE II—EFFECT OF VARIATION IN VOLUME AND CONCENTRATION OF INJECTION ON MEAN HALF-PERIOD IN ARM

| Male controls Constant (0·2 ml.) injection volume | | | Female controls (Varying injection volume) | | |
|---|---|---|---|---|---|
| Units of insulin | No. | Half-period (min.) | Volume (ml.) | No. | Half-period (min.) |
| 8 | 10 | 67±10 | 0·2 | 12 | 55±7 |
| 4 | 5 | 81±17 | 0·6 | 5 | 64±12 |
| 2 | 5 | 80±32 | 1·0 | 5 | 57±13 |

The procedure was to inject labelled insulin subcutaneously and then to take serial counts of 30 seconds duration over the injection site with an end-window Geiger counter,[2] the window being covered with lead foil 1 mm. thick to filter β-particles. The counting-rates were recorded with a 'Clinical Monitor'.[3] Observations were continued at 5-minute intervals and the "half-period" of the injected labelled insulin thus determined. The term half-period is used here to indicate the time in minutes before the initial count was halved. All observations were made at a constant room-temperature of about 90°F (32°C). With the exception of the studies on the effects of variation in volume and concentration of the inoculum (20 subjects) a standard injection was always used. This contained 8 units of labelled insulin in 0·2 ml. of physiological saline, and with a radioactivity of the order of 1 microcurie (1 μC). Observations were usually made after lunch, but despite this several subjects developed mild hypoglycæmic symptoms.

1. Kindly supplied by Boots Pure Drug Co., Nottingham, England.
2. Type E.W.G. 3H. 20th Century Electronics Ltd., New Addington, Surrey, England.
3. Harwell Type 1294A, Dynatron Radio Ltd., Maidenhead, Berkshire, England.

## Results

*Control Subjects*

*Determination of clearance-rates.*—Preliminary observations were made on 29 healthy male and 28 female subjects using the standard injection described. The rate of clearance from the subcutaneous tissues in the three usual sites used by diabetics for injection (front of thigh, lower abdomen, and upper arm) was measured and the half-period determined (table I). Significant ($P < 0.05$) differences were observed in the clearance-rates between the arm and leg in males and females, and between males and females from the leg. The difference in the rate from the arm in males and females just fails to reach significant levels ($P < 0.07$).

TABLE III—EFFECT OF EXERCISE ON MEAN HALF-PERIOD IN ARM IN NORMAL MALE SUBJECTS

| Exercise first 35 min. | | |
|---|---|---|
| No. | Half-period (exercise) (min.) | Half-period (rest) (min.) |
| 8 | 71 | 69 |

*Volume and concentration of injection.*—The effect of varying the volume and concentration of the injection were next studied. Decreasing quantities of labelled insulin (8, 4, and 2 units) were dissolved in 0·2 ml. of physiological saline and the rate of clearance from the arm measured (table II). No significant differences were found. 8 units of labelled insulin were next dissolved in increasing volumes of physiological saline (0·2, 0·4, and 1·0 ml.) and similarly studied (table II). No significant differences were seen.

TABLE IV—EFFECT OF HYALURONIDASE ON MEAN HALF-PERIOD IN ARM IN NORMAL MALE SUBJECTS

| Hyaluronidase (min.) | | | Physiological saline (min.) | | |
|---|---|---|---|---|---|
| No. | Before | After | No. | Before | After |
| 6 | 93±34 | 42±10 | 3 | 65 | 65 |

*Effect of exercise.*—It was thought that the hypoglycæmia after exercise in diabetics who have taken insulin might be

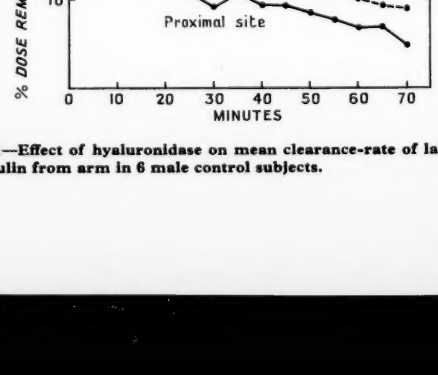


**Fig. 1—Effect of hyaluronidase on mean clearance-rate of labelled insulin from arm in 6 male control subjects.**

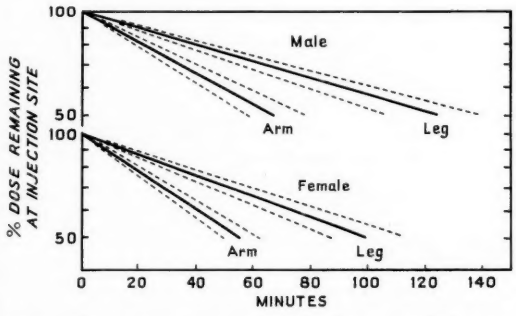


**Fig. 2—Mean clearance-rates with limits of 95% confidence interval (min.) from arm and leg in normal male and female subjects.**

explained by an increased rate of absorption. To investigate this 8 male control subjects were given the standard injection of labelled insulin in the left arm, and were asked to raise a 7 lb. (3·2 kg.) weight 25 times to the full extent of the left arm between readings for the first 35 minutes, and then to sit quietly at rest for a further 35 minutes, when observations were continued. The mean half-period during the rest and exercise period was calculated and compared (table III). No significant difference is apparent, and values observed approximate closely to those seen in normal subjects (table I).

*Effect of adding hyaluronidase to injection.*—In view of some of the results obtained in diabetic subjects (see below) the effect of injected hyaluronidase (' Hyalase ') on the half-period of labelled insulin was investigated. A standard injection of labelled insulin was given into the arm, and serial counts made at the site, and at two points immediately proximal and distal to it for 35 minutes. At this time a second injection of a hyaluronidase solution (0·2 ml. of a solution containing 1500 units in 1 ml. physiological saline) was made, in such a way that the tip of the needle was in the centre of the previous insulin injection. Counting was continued in the same way for a further 35 minutes, and the clearance-rates from the site before and after hyaluronidase compared. Separate values for the half-period during the first and second 35-minute intervals were calculated (table IV). The mean values obtained are shown in fig. 1, together with mean values from the proximal and distal sites. Hyaluronidase caused a significant increase in the rate of clearance of labelled insulin, and counts at the proximal and distal sites also fell. These effects were not repeated when physiological saline (0·2 ml.) was substituted for the hyaluronidase solution (table IV).

TABLE V—DISTRIBUTION BETWEEN SEXES OF NORMAL (MALES < 141, FEMALES < 111 MINUTES) AND PROLONGED HALF-PERIOD IN LEG IN 41 DIABETICS

| Half-period (min.) | Males | Half-period (min.) | Females |
|---|---|---|---|
| Group A > 141 | 6 | Group A > 111 | 9 |
| Group B < 141 | 18 | Group B < 111 | 8 |

TABLE VI—CLINICAL DATA RELATING TO MALE DIABETICS IN GROUPS A AND B (MEAN VALUES)

| Half-period (min.) | No. | Age (yr.) | Height (in.) | Weight (lb.) | Diet | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Cals. | C | F | P |
| Group A > 141 | 6 | 43 | 69 | 156 | 2225 | 210 | 109 | 110 |
| Group B < 141 | 18 | 34 | 70 | 155 | 2168 | 196 | 115 | 99 |

C = carbohydrate, F = fat, P = protein.

Labelled insulin is cleared exponentially (fig. 2) from the sites selected, and the rate of clearance (and hence the half-period) differs between males and females and between the arm and leg in the same sex. The half-period is little influenced by variations in volume or concentration between the limits chosen, nor does exercise have any striking effect. A significant increase in absorption follows the injection of hyalase.

*Diabetic Subjects*

For a pilot study on 41 selected diabetic patients, the standard injection was given in the leg, this being the site most often used by diabetics, and serial counts made as before. The results have been used to divide the patients into two groups (table V), those with normal (group B) and those with a significantly increased insulin half-period (group A). Clinical details of these groups are given in tables VI, VII, VIII, and IX.

Slow clearance was more common in women than men (table V), and the individual results (fig. 3) show that the slowing was greater in women. The ideal weight for each subject was calculated by Kemsley's (1950) method, and observed results compared. Excess weight was expressed as a percentage of ideal weight (fig. 4). Control was noted as good, fair, or bad, as previously defined (Baker, Joiner, and Trounce 1955). The duration of disease is longer in group A, whose subjects are a little older than those in group B.

6 female diabetics from group A were recalled after some months, and the studies repeated on the arm (table X). Absorption from the arm was much better than it had been from the leg.

TABLE VII—FURTHER CLINICAL DATA RELATING TO MALE DIABETICS IN GROUPS A AND B (SEE TEXT) (MEAN VALUES)

| Half-period (min.) | No. | Duration (yr.) | Family history | Fat hypertrophy | Fat atrophy | Units of insulin | Control | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Good | Fair | Bad |
| Group A > 141 | 6 | 11 | 1 | 3 | 0 | 63 | 4 | 1 | 1 |
| Group B < 141 | 18 | 6·3 | 5 | 4 | 3 | 54 | 13 | 3 | 2 |

## Discussion

The counting procedure closely follows that used successfully by Gemmell and Veall (1956) in their work with $^{24}Na$ on the peripheral circulation. Their experience indicated the importance of the external temperature, and all experiments were conducted at about 90°F (32°C). The small volume of the standard injection was chosen so as to derange the local vasculature as little as possible, but the range explored (0·2, 0·6, and 1·0 ml.) includes the volumes of injections given to most diabetics. The small injection of labelled insulin was necessary to avoid too great a dose of radiation: it was thought that no serious local effects were likely from 1 μC even if absorption was very greatly delayed. As an added protection for the thyroid gland, 10 mg. of potassium iodide were given

TABLE VIII—CLINICAL DATA RELATING TO FEMALE DIABETICS IN GROUPS A AND B (SEE TEXT) (MEAN VALUES)

| Half-period (min.) | No. | Age (yr.) | Height (in.) | Weight (lb.) | Diet | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Cals. | C | F | P |
| Group A > 111 | 9 | 37 | 63 | 137 | 1685 | 167 | 81 | 87 |
| Group B < 111 | 8 | 37 | 65 | 135 | 1687 | 152 | 83 | 82 |

TABLE IX—FURTHER CLINICAL DATA RELATING TO FEMALE DIABETICS IN GROUPS A AND B (SEE TEXT) (MEAN VALUES)

| Half-period (min.) | No. | Duration (yr.) | Family history | Fat hypertrophy | Fat atrophy | Units of insulin | Control | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Good | Fair | Bad |
| Group A > 111 | 9 | 7·5 | 3 | 5 | 2 | 73· | 6 | 0 | 3 |
| Group B < 111 | 8 | 3·8 | 3 | 2 | 0 | 90 | 4 | 2 | 2 |

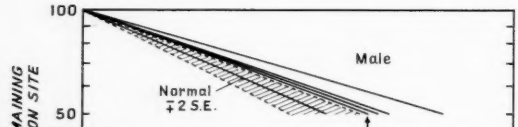


**Fig. 3—Individual results in male and female diabetic subjects from group A.**

orally to most subjects before the experiment. Apart from these considerations, higher doses of insulin would probably have caused considerable hypoglycæmia in some subjects, and so added another variable.

Significant ($P < 0.05$) differences are apparent between the half-period in the arm and leg in the same sex, and between males and females in the leg. No significant difference between sexes was demonstrated in clearance from the abdomen (this may be a function of the method, for a much wider scatter of results in individual experiments from this site was noticed). The difficulties of placing the counter accurately over the injection site are greater in the abdomen than in the arm or leg, and this is particularly so with even slight obesity.

Although technically satisfactory, the conclusions from the experiments in control subjects where volume and concentration were varied cannot be extended without qualification to diabetics. For reasons already mentioned it was judged unwise to go above 8 units (1 $\mu$C) of labelled insulin. This meant using smaller doses (4 and 2 units)

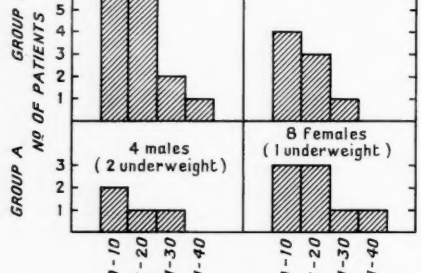


**Fig. 4—Distribution of obesity in male and female diabetic subjects in groups A and B (after Kemsley 1950).**

and therefore recording lower counts with consequently increased counting errors. These facts, together with the small initial dose, make it unwise to extend these results beyond the experimental parameters. Similar criticisms apply to the volume variations used. It may be that in diabetic subjects larger doses and larger volumes do indeed significantly affect the rate of insulin absorption.

It was expected that the effect of exercise would be to increase the rate of insulin clearance. No such result was seen. Exercise may tend to spread the injection irregularly in the tissues, and so contribute to the increased scatter of the counts and therefore reduce the significance of the observations recorded; or variation in absorption may well have been seen if the observations had been possible during more vigorous general exercise. Or it may be that the hypoglycæmia after exercise does indeed depend on factors other than an increased rate of insulin absorption. More work is needed on this point.

On the other hand, there is no doubt that hyaluronidase significantly increased the rate of absorption of labelled insulin. It seems improbable that the reduced counts could be attributed to a spreading effect, for the results from both the proximal and distal counting sites fell concurrently—which may be an important observation with therapeutic implications. If so, then a dilute stable solution of hyaluronidase, capable of being mixed with insulin before injection, is needed. But the difficulties of preparing such a solution seem formidable.

The interesting observations in the diabetics must be interpreted with caution. The sample of 41 cases is too small, and selection was influenced by such considerations as the presence or absence of lipodystrophy and high insulin dosage. Nevertheless, the results are a warrant for further experiment.

TABLE X—COMPARISON OF HALF-PERIOD IN LEG AND ARM IN 6 FEMALE DIABETICS FROM GROUP B

| Case no. | 1 | 2 | 3 | 4 | 5 | 6 | Normal |
|---|---|---|---|---|---|---|---|
| Half-period leg (min.) .. | 190 | 125 | 175 | 145 | 165 | 155 | <111 |
| Half-period arm (min.) .. | 80 | 80 | 70 | 45 | 60 | 70 | <62 |

Groups A and B did not differ significantly in their diets or in the distribution of obesity. Dietary data are fairly complete; full details were available in 29 patients, the total daily calorie intake and carbohydrate content in 4, and the total daily carbohydrate in 8. All patients seemed conscientious and were regular attenders at the clinic, and in none has there been recent variation in body-weight. Strict criteria for determining ideal weights were adopted, but even so only 7 were more than 20% and 14 between 10% and 20% overweight. Moreover, this excess is seen to be distributed evenly between the groups (fig. 4).

In fact, the only remarkable difference between groups A and B is the duration of disease (group A, males 11 years, females 7·5 years; group B, males 6·3, females 3·8 years). It is clear that delayed clearance of labelled insulin is commoner in those whose disease is of longer duration. There is a less notable difference in ages; clearance times seem to increase with age. Both these findings may be easily explained by assuming that repeated insulin injections over the years may in some way damage the subcutaneous tissues and decrease their vasculature. The illustrations of Boulin et al.'s (1952) paper indicate that this may well be so.

It is especially interesting that in 6 cases in which absorption was most prolonged from the usual site of injection (the leg) it was restored nearly to normal when the injection was given in the arm (table x). In 2 cases (1 and 2) the half-period in the arm was 80 minutes; both of these patients customarily gave their injection in the thighs, and general systemic factors may have contributed to localisation of insulin.

It is clear, however, that in this series delayed absorption is not a significant factor in poor control as judged by these criteria, nor is it the sole cause of greatly increased

insulin requirement. That this is not always so is apparent from the work of Chimenes (1959), who states:

"An adult diabetic woman is sent for 'unstable diabetes'. She has an enormous hypertrophy in the right thigh; the left one is normal. For months, while on the same diet and without a single change of her insulin dosage, from Monday to Saturday inclusive, her urine has shown glycosuria +++ and ketonuria; on Sundays she always experiences severe insulin reactions, including hypoglycæmic comas. When asked, she says that during the week she gives herself her injections, on the right side; on Sundays, the day of rest as everyone knows, her husband gives the injection, into her left thigh. After a few days with the injections correctly given in normal sites, she becomes perfectly controlled by a third of the previous dose of insulin."

Although this is a small sample, it is interesting that 10 (66%) of the patients in group A showed either lipoatrophy or lipohypertrophy at the site of their insulin injection, whereas only 9 (35%) of group B did so. The relative frequency of lipoatrophy in women is confirmed. This (lipoatrophy) may not be a specific insulin effect, for similar reactions have been reported in narcotic addicts (Mentzer and DuBray 1927), and are seen at the site of streptomycin injections in patients undergoing chemotherapy for tuberculosis. Lipohypertrophy was commoner than was anticipated when searched for routinely. Root et al. (1944) also noted an association between delay in absorption, "insulin resistance", and local "pad formation" (i.e., fat hypertrophy).

The practical applications of these tentative conclusions seem to be three.

(1) When rapid absorption of insulin is of importance, if any fraction of the total dose is given subcutaneously it should be injected into the arm.

(2) Diabetics should be taught to vary the site of their insulin injections daily; lip service is paid to this in most clinics, but on questioning it is clear that many diabetics have a favourite site.

(3) In some cases absorption of insulin may be facilitated by the addition of hyaluronidase just before injection.

**Summary**

The rate of clearance of insulin labelled with $^{131}I$ from subcutaneous sites in the arm, leg, and abdomen was studied in control subjects. In males the half-period was $67\pm11$ minutes from the arm, $123\pm18$ minutes from the leg, and $76\pm20$ minutes from the abdomen, and in females $55\pm7$, $99\pm12$, and $76\pm20$ minutes respectively.

Variation in volume and concentration, and in the amount of exercise taken by the patient had no significant effects on the rate of clearance.

Hyaluronidase increased the rate of absorption of labelled insulin in control subjects.

A preliminary study of diabetic patients indicates a possible association between lipodystrophy and delayed clearance.

6 female diabetics in whom insulin clearance from the legs was greatly delayed were shown to absorb insulin nearly normally from the arms.

I wish to thank Dr. Christopher Hardwick, for allowing me to study patients under his care; Mr. J. D. Pearson, under whose direction I prepared the labelled insulin; Mr. N. Veall, for many helpful technical suggestions; Mr. G. T. C. Barnes, for his help with the statistical analysis; and Prof. R. H. S. Thompson, for his advice and encouragement throughout.

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*References continued at foot of next column*

# Preliminary Communications

## PREPARATION OF $^{131}I$-LABELLED INSULIN

DURING the past few years, insulin labelled with $^{131}I$ has been widely used, and there now seems little doubt that it is a valuable tool in the investigation of diabetes mellitus. The information recorded by Joiner [1] regarding the subcutaneous clearance of insulin from injection sites could have been obtained only by using insulin labelled with a $\gamma$-emitting isotope.

A simple and rapid method is here described for the radio-iodination of insulin. It is based on methods for the radio-iodination of proteins, such as albumin, described by Veall, Pearson, and Hanley [2] and McFarlane.[3]

REAGENTS

(1) Pure crystalline insulin 12 mg. (6 times recrystallised).

(2) Glycine buffer, pH 9·3.
Aminoacetic acid (glycine) 0·6 g.
Sodium chloride (5·8% w/v) 8·0 ml.
*N* sodium hydroxide 2·0 ml.

(3) *N* hydrochloric acid (1 : 10 dilution of AnalaR concentrated acid with distilled water).

(4) Hydrochloric acid 0·1*N* (1 : 10 dilution of *N* hydrochloride acid).

(5) Potassium iodide 20% w/v.

(6) Iodinating solution. (This solution is prepared immediately before use.)
Thiosulphate-free $^{131}I$ solution.*
Potassium-iodide solution (1 mg. per ml.) 0·4 ml.
Potassium-iodate solution (1 mg. per ml.) 0·1 ml.
*N* hydrochloric acid 0·1 ml.

(7) Human serum-albumin (20% solution).

(8) Ion-exchange column.

Amberlite I.R.A.-400 (Cl)† resin is kept soaked in distilled water. A plug of clean glass wool is placed at the end of the glass column, and enough resin to fill the column to a height of 15 cm. is added. The dimensions are as described by Veall and Vetter.[5] The contents of the column are then washed by sucking through about 300 ml. of distilled water, by means of a filter pump attached to the end of

* Commercial preparations of $^{131}I$ contain sodium thiosulphate, which rapidly reduces the small quantity of carrier iodine present to iodide, which cannot take part in the reaction, and the use of a thiosulphate-free preparation is essential. Such a preparation may be obtained from the Radiochemical Centre, Amersham, Bucks. Alternatively ordinary preparations of $^{131}I$ may be purified by the method described by Staub et al.[4] Normally 1 mC $^{131}I$ is used for each preparation, but higher specific activities may be obtained by increasing the quantity of $^{131}I$. Since $^{131}I$ is carrier-free, the quantity of carrier iodine described above is unchanged for 12 mg. of insulin. 25% uptake of $^{131}I$ is usually obtained.

† B.D.H. Ltd., Poole, Dorset.

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2. Veall, N., Pearson, J. D., Hanley, T. *Brit. J. Radiol.* 1955, **28,** 633.
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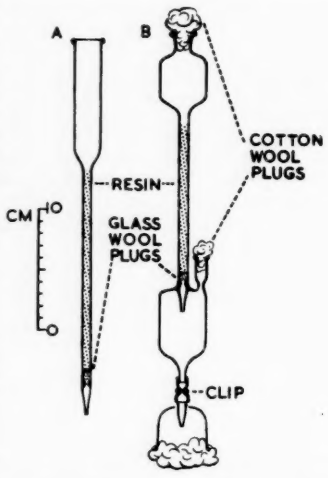
the column. Where a sterile preparation is necessary, the special column described by Veall, Pearson, and Hanley [2] may be used, and the whole assembly is then autoclaved. The type of column used is illustrated in the accompanying figure.

Before use the column is buffered at pH 6·5 by sucking through 50 ml. of the histidine buffer described by McFarlane [3] (DL-histidine monohydrochloride 2·0 g., distilled water 95 ml., *N* sodium hydroxide 9·2 ml.).




**Ion-exchange column used in radio-iodinating process: A, unsterile preparations; B, sterile.**

### METHOD

12 mg. of pure crystalline insulin is added to 2 ml. of distilled water and 1 ml. of glycine buffer. The iodinating solution is added drop by drop with gentle agitation to the buffered insulin solution, which is then allowed to stand for five minutes. The pH of the solution is then reduced to pH 7·3 ‡ by means of 0·1 *N* hydrochloric acid, added drop by drop, and universal indicator paper. After adding 0·1 ml. of 20% potassium iodide, the mixture is allowed to stand for a further 15 minutes and then passed through the buffered ion-exchange column. 1 ml. of 20% human serum albumin § is added to the column effluent.

Radioactive assay may be carried out by using an ionisation chamber such as the N.P.L. type (1383A), or alternatively an aliquot (0·01–0·1 ml.) may be assayed in a calibrated ring counter of the type described by Veall and Baptista.[7]

Where a sterile preparation is required all reagents should be freshly prepared, using pyrogen-free water.

### CONCLUSIONS

The preparation of $^{131}I$ insulin obtained contains no diffusible $^{131}I$; the addition of 20% potassium iodide to the mixture before the ion-exchange treatment ensures that loosely bound iodine is removed in addition to free iodine.[2] Preliminary tests by the rat-diaphragm method [8] have shown no impairment in biological or immunological activity.

Further work on the chemical and biological properties of radio-iodinated insulin will be reported later.

I am grateful to Boots Pure Drug Co., Nottingham, for a supply of pure crystalline insulin, and to Butterworths Scientific Press for permission to reproduce the illustration.

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‡ The pH of the insulin solution is reduced to 7·3 five minutes after the addition of the iodinating solution, since insulin is known to be unstable in alkaline solution.

§ Human serum-albumin is added to minimise adsorption on glassware, and also to protect the insulin from radiation decomposition as suggested by Burrows et al.[6]

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8. Wright, P. *Biochem. J.* 1959 (in the press).

## DISSEMINATED MALIGNANT MELANOMA

### RESPONSE TO TREATMENT BY MASSIVE DOSAGE OF A CYTOTOXIC AGENT COMBINED WITH AUTOGENOUS MARROW REPLACEMENT

ALL too frequently, malignant melanoma disseminates despite vigorous local therapy, and once widespread it is generally resistant to ionising radiations and to cytotoxic agents in conventional dosage.

Creech et al.[1] reported regression of melanomatous deposits in a limb perfused with nitrogen mustard in high concentration. During the perfusion they used an extracorporeal circulation, and they were thus able to prevent generalised bone-marrow damage.

With this tumour response in mind, and encouraged by successful experience with autologous marrow replacement after large-field irradiation,[2 3] we decided to treat a terminal case of disseminated malignant melanoma with a massive intravenous dose of 'Degranol' (manuomustine hydrochloride B.C.M.) followed by reinfusion of the patient's own stored marrow.

### CASE-REPORT

Mrs. A, aged 38, was referred to Sir Stanford Cade on Nov. 26, 1957, after the recent excision of a malignant melanoma over the right scapula. Enlarged lymph-nodes were found in the right axilla, and, after preoperative irradiation, axillary block dissection was performed on Dec. 17, 1957. The primary site was also irradiated.

She returned on Jan. 18, 1959, with nodules in the scalp, right axilla, and both breasts, and subcutaneously in the trunk and thighs. The liver was enlarged to the umbilicus, there was clinical evidence of intracranial involvement, and radiography showed scattered pulmonary deposits.

*Aspiration of bone-marrow.*—On Jan. 27 marrow containing $0{\cdot}8 \times 10^9$ cells was aspirated, under general anæsthesia, from the sternum, iliac crests, and vertebral spines. It was stored at −79°C. as previously described.[3]

*Administration of degranol.*—3000 mg. of degranol was given intravenously over five days from Jan. 28 to Feb. 2 by rapid injection into a continuous 5% dextrose drip. On each of the first four days 500 mg. was given in ten divided doses, and on the fifth day 1000 mg. in ten doses. In addition she received

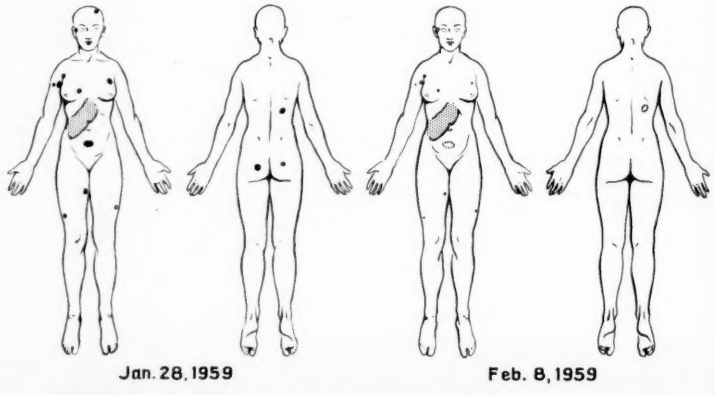


**Fig. 1—To show response of subcutaneous nodules. The liver is unchanged.**

1. Creech, O., Jr., Krementz, E. T., Ryan, R. F., Winbled, J. N. *Ann. Surg.* 1958, **148**, 616.
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daily from Jan. 26 prednisone 20 mg., perphenazine 16 mg., tetracycline 600 mg., and vitamin K 100 mg.

*Reinfusion of marrow.*—On Feb. 2 half the stored marrow was thawed, reconstituted by the Sloviter technique,[4] and injected intravenously over one hour, the residue being held in reserve.

*Clinical course.*—During the degranol infusion the patient complained of moderate nausea but vomited only once. On Jan. 30 she had pain and tenderness in the ribs and sternum; skeletal pain became generalised by Feb. 3.

Regression of skin nodules was first evident on Feb. 3, with complete disappearance of some during the next five days. The liver remained clinically unchanged (fig. 1).

Hæmatological changes were first observed on Jan. 31 (the third day after starting degranol) with a fall in lymphocytes and hæmoglobin followed by depression of the total white-cell count and finally a sharp drop in platelets (figs. 2 and 3).

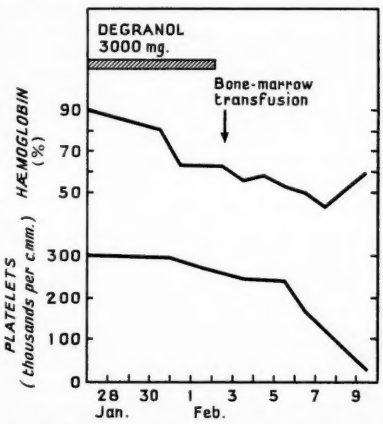


**Fig. 2—Response of hæmoglobin and platelets.**

Transient elevation of the leucocyte-count on the day after a marrow transfusion should be noted (cf. Newton et al.[3]).

On Feb. 5 severe headache commenced, accompanied by vertigo and vomiting. On Feb. 8 she lapsed into semicoma. She died the next day, shortly after a severe epistaxis.

*Necropsy.*—Death was due to hæmorrhage into a necrotic metastasis in the left cerebellar hemisphere. Metastases were widespread throughout the lungs, peritoneum, and liver. Macroscopically the hepatic deposits in particular showed extensive central necrosis. Necrosis was also evident microscopically in those nodules in the breasts and subcutaneous tissues which had clinically regressed (figs. 4 and 5).

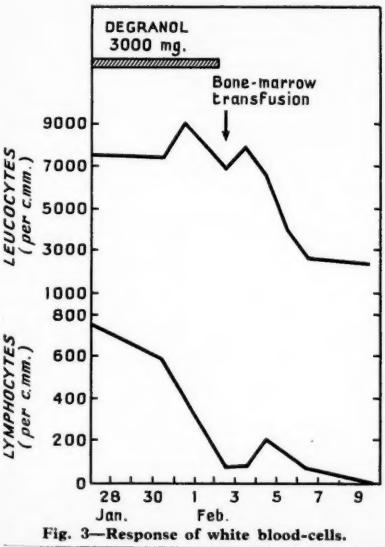


**Fig. 3—Response of white blood-cells.**

Histology of the sternum and iliac crests showed a generally aplastic picture. There were, however, scattered foci of actively regenerating marrow cells, for the most part of the white-cell series.

## DISCUSSION

This case demonstrated that a large dose of a cytotoxic agent may be given with remarkably few immediate side effects, and yet produce rapid and dramatic shrinkage of deposits of melanoma.

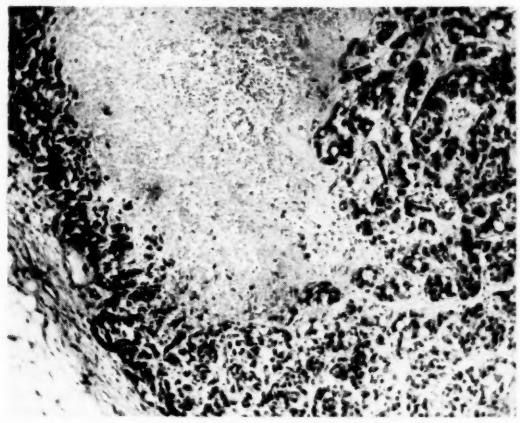

**Fig 4—Nodule from right breast showing peripheral tumour surrounding necrotic zone. (Hæmatoxylin and eosin. × 70.)**

Death from cerebral hæmorrhage occurred too soon for the results of marrow transfusion to be seen in the circulating blood; but postmortem examination of the marrow suggests that regeneration was in fact taking place. Whether this represents recovery from the effect of the cytotoxic agent, or repopulation by the injected cells, cannot be determined.

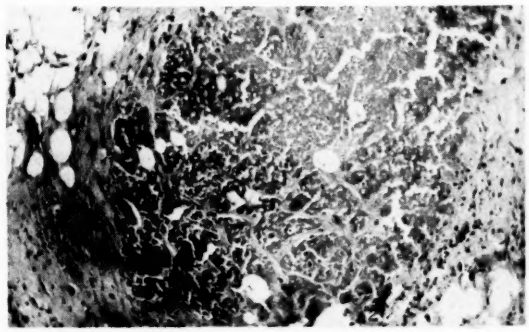

**Fig. 5—Nodule from abdominal wall showing necrosis and loss of nuclear staining of tumour cells. (Hæmatoxylin and eosin. × 70.)**

The unexpected and rapid regression of the deposits in this patient appears sufficiently encouraging to warrant further trial of this method of therapy in similar advanced cases.

Our thanks are due to Sir Stanford Cade for permission to treat his patient, and for his constant encouragement and enthusiasm. We are also grateful to Dr. D. H. Mackenzie for the photomicrographs, Dr. L. E. McGee, who performed the necropsy, and the department of medical photography, Westminster Hospital, for the illustrations.

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# Medical Societies

## BRITISH ASSOCIATION OF PHYSICAL MEDICINE

THE 16th annual meeting of the British Association of Physical Medicine was held at Guy's Hospital, London, on April 17 and 18. The retiring president, Dr. P. BAUWENS, was in the chair, and Dr. H. A. BURT was elected to succeed him. We publish below brief accounts of some of the contributions to the meeting.

### Graphical Representation of Movement

Dr. J. JOSEPH described the electromyographic findings in subjects standing at the stand-at-ease position. The postural muscles of the leg and thigh were examined by surface electrodes. Electrical activity was detected only in the calf muscles. Dr. Joseph suggested that the stand-at-ease position was maintained by the calf muscles and by the ligaments of knee and hip. If the subject flexed or extended the trunk, electrical activity could be detected in the hamstrings and the gluteii. These findings were illustrated by a film showing simultaneous pictures of the subject moving and of the motor-unit potentials displayed on the oscilloscope.

Dr. A. NIGHTINGALE described a method of measuring tension in the calf muscles, and showed that an increase in tension could be related to the amplitude of motor-unit potentials recorded by electromyography.

Dr. T. H. HILLS showed a film on cineradiography of the cervical spine, in which an image intensifier had been used to avoid exposing the subject to excessive radiation. The film illustrated the wide range of movement at the posterior intervertebral joints on normal flexion and extension of the cervical spine. This movement was much limited at the site of disc degeneration. Even the wearing of a light felt collar restricted spinal movement, and a rigid brace or plastic collar allowed only slight movement at the atlanto-axial joints.

Mr. C. ENGEL described the technique and advantages of sequential still photography in the study of movement. Still photographs could be analysed in detail, and rapid shutter action allowed several pictures to be taken each second with good definition. Dr. P. HUME KENDALL discussed the application of this technique to the study of spinal movement, and its possible use in assessing the value of different treatments.

### The Spine

Dr. J. M. TANNER discussed the difference in rate of growth of various parts of the body, especially the trunk and the limbs, and the growth spurt at adolescence which was due mainly to growth of the vertebral bodies at the epiphyseal plates. Studies of inbred rabbits suggested that the size and shape of the vertebræ were determined genetically.

Prof. R. J. LAST described the anatomy of the spine, relating structure to function whenever possible. While the function of the ligamenta flava and supraspinous ligaments was obvious, he could not account for the function of the anterior and posterior longitudinal spinal ligaments or for their curious attachment to the intervertebral discs and vertebral bodies. The intervertebral disc was a strong ligament binding the vertebræ together, and its fibres were continuous with those of the epiphyseal plate. The obliquely directed fibres of the annulus fibrosus, crossing each other in adjacent laminæ, controlled torsional movement of the vertebral column as well as limiting flexion and extension in any plane. The nucleus pulposus consisted of gel-like material, and when it was compressed it exerted a considerable centrifugal force on the fibres of the annulus which were stretched, not compressed, on weightbearing. The hyaline cartilage of the epiphyseal plate persisted in adult man, ossification taking place only at the periphery. This cartilage rested on trabeculæ of cancellous bone and was in contact on one side with the bone-marrow and on the other with the nucleus pulposus. In other animals the entire epiphyseal cartilage was converted into bone.

Describing the pathology of degenerative disease of the spine, Dr. A. D. THOMSON said that the synovial joints of the spine, including the posterior intervertebral, costovertebral, and possibly the neurocentral joints were subject to the same degenerative changes which affected other synovial joints, with fibrillation of cartilage, eburnation of bone, and osteophyte formation. These osteophytes could project into and deform the intervertebral foraminæ. Vertical prolapse of the nucleus through the cartilaginous plate resulted in Schmorl's nodes, while bulging of the annulus anteriorly or posteriorly elevated the periosteum and produced osteophytes. These protrusions could compress the spinal cord, especially in the cervical region.

Dr. E. J. CRISP discussed the clinical aspects of intervertebral disc lesions and the way in which spinal traction might affect them. He distinguished between the acute and chronic phases of disc lesions, and for acute symptoms he recommended bed rest or immobilisation in a plaster jacket rather than manipulation. Discussing lesions which might affect the posterior intervertebral and costovertebral joints, he suggested that some acute short episodes of severe back pain brought on by bending and relieved by manipulation might be due to nipping of the synovia of these joints.

### Accidents in Hospital

Dr. R. HARRIS said that accidents could happen in departments of physical medicine that were badly lit, poorly sited, incorrectly equipped and understaffed, and even when such factors had been eliminated, accidents still occurred. He had kept a record of all accidents to staff or patients in one hospital dealing with severely disabled patients. During some 800,000 treatments over a period of four years, 43 accidents were reported, 38 involving patients. There were only 5 burns, mostly minor, only 2 of which could be ascribed to faulty technique. Falls from plinths and stools, and wheel-chairs with faulty brakes, were common causes of injury, usually slight. Some physiotherapists seemed to be more accident-prone than others. Such accidents could be prevented by lowering plinths and overhead suspension apparatus, replacing stools with overlapping edges, making floors non-slip, and by the regular overhaul of wheel-chairs every three months, preferably by the hospital engineer.

### Treatment of Rheumatoid Arthritis

Dr. G. HOLDEN and Dr. HUME KENDALL compared the effects of intra-articular injections of 25 mg. of prednisolone and 100 mg. of prednisolone trimethyl acetate in a small number of patients with rheumatoid arthritis. The range of joint movement at each examination was expressed as a percentage of the maximal possible change, and joint tenderness was assessed on a numerical scale. They concluded that the greatest improvement followed the first injection of intra-articular prednisolone if injections were given at short intervals. If single injections were given, 100 mg. of prednisolone appeared to be more effective than 25 mg., though there was sometimes a temporary increase in joint pain.

Dr. G. D. KERSLEY discussed the treatment of 36 patients suffering from rheumatoid arthritis with alternating courses of hydroxychloroquine ('Plaquenil'), amodiaquine ('Camoquin'), and control tablets. The initial dose of hydroxychloroquine was 400 mg. daily, but this was later doubled. The initial dose of amodiaquine was 400 mg. daily, but this was later halved because of toxic effects. Most patients benefited from treatment with antimalarial drugs, though the effect was often delayed for a few weeks. Mild side-effects were frequent and sometimes noted by the patient only when he had stopped taking the drug. The best results were with hydroxychloroquine, 800 mg. daily, but relapses followed cessation of treatment. Examination of the cornea with a slit lamp revealed corneal opacities in nearly half the patients, but these were often symptomless and disappeared in all cases within six months of stopping the antimalarial drug. They were commonest in patients taking amodiaquine. A patient died from agranulocytosis while taking amodiaquine.

# Reviews of Books

## Family Relationships and Delinquent Behaviour

F. IVAN NYE, PH.D., director, sociological research laboratory, State College of Washington. New York: John Wiley. London: Chapman & Hall. 1958. Pp. 168. 40*s*.

THE study of abnormal behaviour has gained much from the sociological approach, particularly in the matter of antisocial activities. But sociologists are as liable as anyone else to build walls round their empire, and this very important and well-produced book seems to contain some of the best and the worst that sociologists have to offer. Dr. Nye rightly states that any study of delinquency based on a reform-school population is biased at the outset, since magistrates will be influenced in their sentencing by the very factors the investigator wishes to study—broken homes, for example. This work is therefore based on questionnaires, filled in by 780 adolescent boys and girls in 3 medium-sized Washington towns. The methodology and statistical treatment are excellent, but questionnaires do not always tell the whole story, and other evidence would have been welcome.

The broken home is put in perspective: in this group it was the happiness of the home that mattered, tense but unseparated parents having the worst associations. Father's influence at at all stages seemed the most crucial in forming social attitudes, especially of girls, though families where mother went out to work showed rather more delinquency, other factors being constant (this is not in accord with recent findings in this country [1]). Corporal punishment made no difference either way, though punishment by nagging or withdrawal of affection seemed to have pernicious effects, and the extremes of always or never punishing correlated highly with crime. Children who were made to feel competent and trusted usually did well, but feelings of rejection, especially when mutual, seemed to be very damaging. The usual social-class distribution was absent, possibly a reflection of the locality since most of such studies have been in large cities. The not-unexpected picture emerged of the "normal" child sharing values, recreation, and affection with the parents in a happy united family over which father, as the head, exerted moderately firm control.

Dr. Nye may be right in stating that his findings support the "social control" theory, but the identification of child with parent (one of his "indirect controls") is a more profound phenomenon than he would have it. Thus, he says at the outset: "It is now generally agreed that instincts play a minor if not non-existent role in human behaviour." To approach the study of the child wearing such antidynamic blinkers is to miss some of the point: in studying the "here and now" life, the sociologist produces meaningful correlations largely in so far as this life echoes the vital formative phases of the earlier years, for clearly parents will tend to go on as they have started. To understand the roots of personality and behaviour, long-acting influences must be studied, as, for example, in the important work of Hewitt and Jenkins.[2] Medicine is not the only science that needs to learn the multidisciplinary approach.

## De Motu Locali Animalium

Edited and translated from the work of WILLIAM HARVEY by GWENETH WHITTERIDGE, M.A., D.PHIL., F.S.A., archivist, St. Bartholomew's Hospital, London. London: Cambridge University Press. 1959. Pp. 163. 60*s*.

AT one point in *De Motu Cordis*, Harvey indicated his intention of publishing an account of animal movements. The promised work never appeared, and it was generally concluded that the notes, on which it was to have been based, were among the manuscripts destroyed in 1642 when the Parliamentary troops looted Harvey's house. About a hundred years ago, however, these notes were found amongst Sir Hans Sloane's papers in the British Museum, and they have now been transcribed for the first time.

In her preface, Dr. Whitteridge makes light of the labour involved. But deciphering the rough notes of any author from an original in medieval, often abbreviated, Latin, must have been a formidable task: and even Harvey's contemporaries acknowledged that "he wrote a very bad hand". *De Motu Locali Animalium* is written in a very different style to Harvey's other works: experimental methods, for instance, are scarcely invoked at all. And, even if it contains nothing comparable to the discoveries described in his other writings, we are indebted to Dr. Whitteridge for an addition to our knowledge of a remarkable man.

## Cancer of the Pharynx, Larynx and Œsophagus and its Surgical Treatment

RONALD W. RAVEN, O.B.E., F.R.C.S., surgeon, Westminster Hospital Teaching Group, Royal Marsden Hospital, and the French Hospital, London. London: Butterworth. 1958. Pp. 302. 67*s*. 6*d*.

Mr. Raven is a ubiquitous surgeon who has made the treatment of cancer his specialty for many years. He has here recorded his experience in the surgery of malignant disease of the upper respiratory tract and the œsophagus, and he sets it in a very useful framework of relevant anatomy and pathology. The style is brisk and clear and the text generously illustrated. The author's surgical techniques are described in detail, with their indications and the postoperative management of the patient. Much of the literature is quoted, but efforts to devise a satisfactory one-stage operation in cancer of the hypopharynx are not discussed. The scope of the book being confined to surgery, the overall management of cancer in the upper respiratory tract sometimes seems out of balance. The limitations of irradiation, especially in laryngeal carcinoma, are perhaps overstated, and little is made of cooperation with the radiotherapist. The section on the œsophagus, with emphasis on the restoration of swallowing, whatever the condition of the growth, is a fitting climax to the book.

## Bacteriophages

MARK H. ADAMS. London: Interscience Publishers. 1959. Pp. 592. 115*s*.

BACTERIOPHAGES, better known as phages, have been extensively studied as models to investigate the characters, properties, and mode of multiplication of viruses. This new book claims to be the first comprehensive work on the subject for thirty years. Its celebrated author died before its completion, and it was revised, brought up to date, and finished by prominent research-workers in virology.

The book contains studies of the morphology, antigenicity, and host specificity of phages, and it discusses their effect on host cells, the processes of adsorption, penetration, and intracellular multiplication of phages, and the actions of physical and chemical agents and radiations upon them. Chapters on lysogeny and the comparison of phages and bacteriocins are contributed jointly by F. Jacob and E.-L. Wollman. The phages most fully studied are the T group of coliphages, particularly T2 and related phages; and much of the book is concerned with experiments on this group. One of the most important sections deals with the genetics of phage multiplication: much recent work with T2 and T4 on genetic recombination, heterozygosis, pseudoallelism, and multiplicity reactivation is described in detail.

Beyond their purely scientific significance, phages are also of interest to medical bacteriologists because they have been used with considerable success to identify different types in several species of bacteria. The various methods used in the phage-typing of bacteria are discussed by Dr. E. S. Anderson. The book lists approximately 900 references. As an appendix, an article published by the author in 1950 gives details of methods used in the study of bacterial viruses. This has been brought up to date and slightly revised.

The book is clearly written, and 18 of the 22 chapters have useful summaries of the principal points which emerge from the experimental results. In the chapter on phage genetics more discussion of the significance of the facts would have

1. Cartwright, A., Jefferys, M. *Brit. J. prev. soc. Med.* 1958, **12**, 159.
2. Hewitt, L. E., Jenkins, R. L. Fundamental patterns of Maladjustment. Michigan Child Guidance Institute, Illinois, 1946.

been helpful. The book will probably become a standard reference for those studying bacteriology, virology, and genetics.

**Pathophysiology in Surgery**

JAMES D. HARDY, M.S. Chem., M.D., F.A.C.S. London: Baillière, Tindall, & Cox. 1959. Pp. 704. £7 12*s*.

WRITTEN by a single author, a general surgeon, this book may have a misleading title, because it is not confined narrowly to surgical physiology but ranges widely and invades the fringes of other subjects in the hope of providing for the expanding needs of the general surgeon. Dr. Hardy's main objective was to improve the care of individual patients and to provide a sound factual basis for the understanding of likely future advances in surgical thought and practice. At times the book reads like any other comprehensive textbook of surgery and it might have been better to give more attention to the physiological aspects of surgical principles than to accounts of surgical technique. It contains a vast amount of information, but it is disappointing to find that only about 5% of the references are to British work.

To some surgeons the balance may seem uneven; operative techniques for dealing with intestinal obstruction are given as much space as a survey of the normal secretory, absorptive, and motor functions of the small intestine, and three times as much space as ileus. More space, a fifth of the book, is devoted to the circulatory system than to all the abdominal organs, which may reflect the trend of present interest and future possibilities. The historical aspect is not neglected and short introductory accounts of ancient observations add greatly to the interest of some sections and the pleasure of reading the book. Parts of this book can be read profitably by by any surgeon, but for the British undergraduate it is too detailed and discursive and there is not enough depth in it for the postgraduate reading for his surgical fellowship.

**Shakespeare and Medicine**

R. R. SIMPSON, M.B., F.R.C.S., F.R.C.S.E. Edinburgh: E. & S. Livingstone. 1959. Pp. 267. 25*s*.

EVERY year some seventy or eighty books are published in this country alone dealing with different aspects of Shakespeare's life. The poet considered as a soldier, as a lawyer, as a gardener. In 1883 there was even a volume on Shakespeare as an angler; and last week two contributors to *Punch* made a praiseworthy effort to identify The Bard as a cricketer. But, surprisingly enough, only once has a full-length study appeared of the medical allusions in his plays, and that almost a hundred years ago.

Mr. Simpson has now examined these allusions in the greatest possible detail. He has listed them all: and by ingeniously charting the number of such references in each play against the dates on which each play was written, he shows that Shakespeare's debt to his physician son-in-law, John Hall, in medical matters, is less than has been supposed in the past. Because some quotations are discussed under several headings, there is a certain amount of repetition. Thus, the delicate business of Juliet's weaning is described on four separate occasions, and the line describing the pharmacological properties of onions is also quoted four times. Nevertheless this is a scholarly and novel work, painstakingly compiled, which will appeal to many doctors with literary inclinations.

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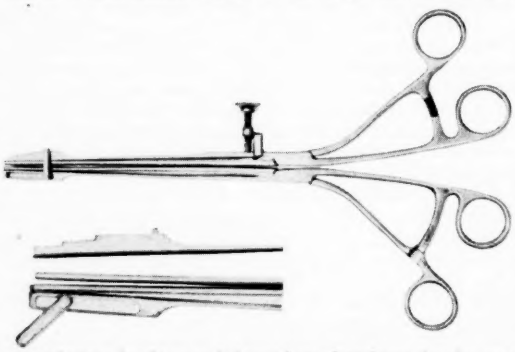
**Sensitivity Reactions to Drugs** (Oxford: Blackwell Scientific Publications. 1958. Pp. 237. 35*s*.).—The symposium on this subject, organised by the Council of International Organisations of Medical Sciences, has been published under the editorship of Prof. M. L. Rosenheim (who was the chairman) and Dr. R. Moulton. In his introduction Professor Rosenheim cites a report by D. P. Barr that in a great hospital there were 50 major toxic reactions and accidents among 1000 patients subsequent to diagnostic and therapeutic measures. This book could usefully be read by anyone who prescribes drugs.

# New Inventions

## A SIMPLIFIED LOCK FOR THE OPEN END OF THE LANE'S TWIN CLAMP

IN many years' constant use of the Lane's twin clamp for gastrojejunal anastomosis, I have had no complication from its application; but it has one disadvantage in that the stomach is insecurely held at the open end of the clamp and tends to slip. Successful modifications have been made; but they involve the use of a mill-headed screw at the open end, which is an



encumbrance in obese and deep-chested patients, for the screw may have to be fixed while within the parietes.

In the new modification the open ends of the forceps are easily secured by means of a link running in a slot in one blade which can be turned over to the other. Steps in the second blade allow for different thicknesses of tissue to be held with the appropriate pressure. Many experiments with the clamp have shown it to be "foolproof". It has no loose parts to be lost and no traps which may harbour organisms.

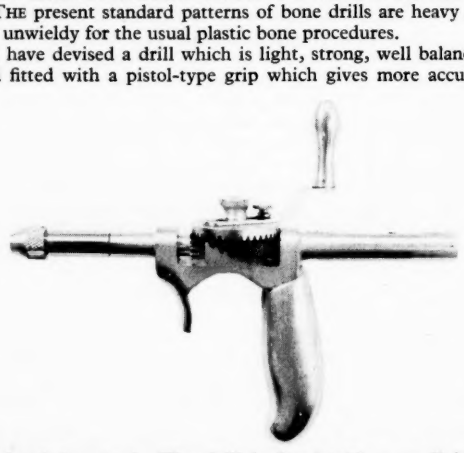
This clamp has been made for me by Messrs. John Bell & Croyden.

NORMAN C. TANNER
M.D., F.R.C.S.

## A LIGHT-WEIGHT HAND-POWERED DRILL

THE present standard patterns of bone drills are heavy and too unwieldy for the usual plastic bone procedures.

I have devised a drill which is light, strong, well balanced, and fitted with a pistol-type grip which gives more accurate



one-handed control. The drill is fitted with a small hand driving-wheel with variable position for the crank; or the driving-wheel can be removed so that the drill can be connected to the ordinary mobile dental-engine flexible drive. The chuck is small, but is supplied with three collets of different sizes to allow drills up to $^3/_{32}$ in. to be used. In addition, the shaft of the drill is hollow to allow for the use of Kirschner wires.

This instrument has been produced for me by Allen & Hanburys Ltd., London, E.2.

J. P. REIDY
M.A., M.B. Cantab., F.R.C.S.

London, W.1

THE LANCET

LONDON 9 MAY 1959

## Any Old Iron?

THE importance of iron as an indispensable catalyst has been recognised since WARBURG demonstrated its participation in oxygen-carrying cell enzymes—for instance, cytochromes, peroxidases, and catalases—by means of which intracellular respiration is carried on and without which life would be impossible. Yet iron can also be harmful. Serious general toxic effects may follow the ingestion of large amounts of soluble iron compounds—as, for example, when attractive-looking tablets of ferrous sulphate are consumed by young children in mistake for sweets.[1 2] Local irritant effects followed injection of the early intramuscular iron compounds and may be noted after the maladroit injection of intravenous preparations; and general reactions are the rule when the dose of intravenous iron grossly exceeds the total iron-binding capacity of the plasma. There is, then, no doubt that excess of iron can produce *acute* cytotoxic effects; but the effects on the tissues of *chronic* iron overload are much less clear. This may interfere with the delicate metabolic activities of cells in ill-defined ways, but the practical question of the moment is simply this: Is long-continued iron excess potentially fibrogenic? It has proved surprisingly difficult to obtain a clear answer to this apparently simple question. The association of hepatic fibrosis with iron accumulation, long recognised in classical hæmochromatosis and more recently in thalassæmia with long survival, has encouraged experimentation; but in laboratory animals (many species have been used) it has proved uniformly impossible to produce cirrhosis of the liver merely by administering iron, either by mouth or parenterally. While in the earlier studies the amounts of iron used and the duration of the experiments may be criticised as not always adequate, these defects seem to have been remedied in more recent work.[3] There is virtually no excretion of iron introduced into the tissues; and the widespread use of parenteral administration in the past few years, particularly since the introduction of an intramuscular preparation, makes it all the more desirable to know how serious is the potential danger of chronic iron intoxication. Where animal experiment has failed, its human counterpart—namely, study of the tissues from cases of aregenerative anæmia long maintained by blood-transfusions—may yet supply at least part of the answer.

When, some ten years ago, such material became available the resemblance of the changes to those of classical hæmochromatosis was emphasised in publications under such titles as " transfusional " or " exogenous " hæmochromatosis [4-7]; but it now seems clear that in many instances the analogy was overdrawn. Critical review of these cases shows that hæmosiderosis—i.e., iron accumulation in the internal organs without the accompanying fibrotic changes which characterise hæmochromatosis—is the most usual finding. In some, fibrosis was observed; occasional patients presented the classical picture of bronzed diabetes, but in the majority fibrosis was much less pronounced. Now that visual assessment of stained histological preparations has been supplemented in some cases by chemical analysis of the amount of iron actually present, two points have emerged. First, the amount of iron present and the duration of therapy do not by themselves determine the development of fibrosis. Secondly, it is evident that in the past fibrosis has been attributed to transfusions when the amount of iron from the blood given and the duration of therapy were alike totally inadequate to produce such an effect. The risk of hepatitis in the course of multiple transfusion therapy is real, and hepatic fibrosis caused in this way may explain some cases. When the amount of iron found post mortem is related to the amount that could have been derived from the transfusions, an interesting and perhaps highly significant fact emerges. MUIRHEAD et al.[5] in 1949 observed that substantially more iron might be present than could have come from the transfusions, and this has been repeatedly confirmed. Since the only source of the additional iron is the gut, CAPPELL, HUTCHISON, and JOWETT [8] have suggested that iron absorbed from the gut may be fibrogenic, whereas that derived from the breakdown of blood may be relatively bland. This hypothesis derives support from several sources. There is clear evidence that excessive absorption of iron from the gut may continue, irrespective of the body store of iron, if the marrow is active, but this does not occur if the marrow is hypocellular.[9] If absorbed iron is in fact related to fibrosis we should then have two groups of cases: (1) those with iron in the tissues in excess of the amount transfused, which should show fibrosis and should not have hypocellular marrow; and (2) those without excess iron, which should not show fibrosis and probably not have hypercellular marrow. Broadly, this seems to be so. BOMFORD and RHOADS [10] in 1941 pointed to the relation of hypercellular marrow to secondary " hæmochromatosis ", and OLIVER [11] is careful to classify his own series of 22 cases according to the cellularity of the marrow.

Adherence to this procedure would have added to the value of his review of other reports. In his review (table I) BOMFORD and RHOADS' first case is cited as aplastic anæmia, although later (table VI) the marrow is stated to be hypercellular. Also the series of 5 cases described by CAPPELL et al.[8] are all listed as refractory anæmias, " anæmias with normal or increased cellularity of the marrow ", whereas all 5 had hypocellular marrow.

1. Thomson, J. *Brit. med. J.* 1947, i, 640.
2. Thomson, J. *ibid.* 1950, i, 645.
3. Nissim, J. A. *J. Path. Bact.* 1953, **66**, 185.
4. Schwartz, S. O., Blumenthal, S. A. *Blood*, 1948, **3**, 617.
5. Muirhead, E. E., Crass, G., Jones, F., Hill, J. M. *Arch. intern. Med.* 1949, **83**, 477.
6. Graef, I., Gordon, B. S., Newman, W., Olivetti, R. G., Klein, B. *Amer. J. Path.* 1952, **28**, 538.
7. Morningstar, W. A. *Arch. Path.* 1955, **59**, 355.
8. Cappell, D. F., Hutchison, H. E., Jowett, M. *J. Path. Bact.* 1957, **74**, 245. See *Lancet*, 1957, ii, 1044.
9. Pirzio-Biroli, G., Bothwell, T. H., Finch, C. A. *J. Lab. clin. Med.* 1958, **51**, 37.
10. Bomford, R. R., Rhoads, C. P. *Quart. J. Med.* 1941, **10**, 175.
11. Oliver, R. A. M. *J. Path. Bact.* 1959, **77**, 171.

This makes a general correlation of the different factors difficult.

When we come to consider OLIVER's own series we are on firmer ground; for by inference a case listed as aplastic may be assumed to have a hypocellular marrow, otherwise it would be listed as a refractory anæmia. In 7 of his cases hypocellularity can be excluded (4 refractory, 2 hæmolytic, 1 hypersplenism). 6 of these 7 showed liver fibrosis; in only the 7th was the iron content analysed, and no excess of iron over what had been transfused was found. Of his 10 aplastic cases only 2 showed liver fibrosis; in 1 the iron content was analysed, and less iron was recovered than had been transfused. The remaining 5 cases were leukæmias (3) and myelosclerosis (2), in which other factors intrude. Clearly only by iron analyses in further cases will final assessment of the hypothesis of CAPPELL et al. be possible. Meanwhile OLIVER's well-founded study is a substantial contribution.

Secondary hæmochromatosis has been attributed not only to multiple transfusions but also to oral iron therapy in anæmia of long duration without transfusion [12–15] or with transfusion of only an insignificant amount of blood.[16] But even if iron absorbed from the gut and stored is potentially fibrogenic, we still do not know why this should be so. It might be informative to determine the copper content of the liver in cases with and without excess iron; iron derived from the gut and stored may be contaminated with copper—a known cause of hepatic fibrosis.[17] On the existing evidence it seems justifiable to conclude that long-continued oral iron is best avoided unless there is evidence that iron is really required. GRANICK'S mucosal-block mechanism in the absorption of iron is now generally agreed not to provide the absolute protection once ascribed to it, and the belief that iron by mouth is harmless may require some modification. Furthermore, iron derived from two sources is undoubtedly present in the tissues of some of these patients. Any old iron from effete red blood-cells may not be as damaging as iron absorbed from the gut.

## Social Service: a New Pattern

THE pattern of medical care is always changing; and today we are increasingly concerned with safeguarding health, with enabling the patient to stay at home and at work if he can, and with his return from illness to normal life. More thought is given to the patient as a person, to his surroundings, to the way he lives, and to his emotional difficulties. Because of this the doctor is seeking more help from social workers and making more use of the social services offered to the patient in his own home. The Working Party presided over by Miss EILEEN YOUNGHUSBAND have been considering how this help and support can be modified to meet more adequately and appositely the needs of today.[18] Their task has been no easier because they were asked to advise on a problem which is only part of a larger one. For their inquiry was limited to workers in the medical and welfare services of local authorities; and outside the pages of a blue-book the claims of these services will have to be reconciled with those of other kinds of social work. Even in the medical department, relationships, for example, with the health visitor (and, indeed, with the medical officer of health) are going to need some further thought.

Admittedly, though there is a shortage of social workers almost everywhere, in the local-authority services it is most acute. As a remedy the Working Party propose fundamental changes in the structure of this loosely knit group of callings, which contains so many and varied specialists. Our social services, like most British institutions, have grown piecemeal. Each has come into being to fill some gap, or to help some particular group, such as the blind, the old, and the tuberculous; and each, moreover, has shown tenacity and resource. But now that they have proved their independent worth the time has come when they should be offered recognition and an opportunity for orderly coordination. The Working Party accordingly suggest that these specialties should be gathered together into a profession with three kinds of workers:

*Welfare assistants*, working under the supervision of trained workers, would offer obvious and practical help to people with fairly straightforward, though perhaps continuing, difficulties. These assistants would probably be used in work with the elderly, the handicapped, and stable mental defectives, rather than with the mentally ill, with unmarried mothers, or with problem families.

*Officers with a general training* would help people with more complex problems and would do most of the work at present done by welfare officers, visitors to the handicapped, home workers with the blind and deaf, and mental welfare officers. They would deal with family problems and aftercare. Except in the countryside, one officer could not cover all these services; but local authorities might be able to group some services together according to circumstances.

*Professionally trained social workers*, such as almoners and psychiatric social workers, would be responsible for more complex case-work, act as consultants to the general social workers, supervise newly qualified trained workers, and help in the training of welfare assistants.

This reorganisation inevitably led the Working Party to consider training. The professionally trained social worker is fortunate in that recognised training is already offered her. In the different specialties there are university degrees, diplomas, and certificates requiring 3–4 years' full-time study and practice. For the other two proposed groups of workers no formal training or recognition exists, and the Working Party believe that this should be remedied. For the welfare assistants they suggest an in-service practical training, lasting 6–8 weeks, which would be supervised by the professionally trained worker. Such training, however, should be planned and not just dwindle to "picking it up on the job". An unacademic start of this kind might prove a useful selective sieve: men and women who found satisfaction in the work and showed aptitude for it might be encour-

12. Wyatt, J. P., Mighton, H. K., Moragues, V. *Amer. J. Path.* 1950, **26**, 883.
13. Houston, J. C. *Guy's Hosp. Rep.* 1915, **100**, 355.
14. Wallerstein, R. O., Robbins, S. L. *Amer. J. Med.* 1953, **14**, 256.
15. Castleman, B. *New Engl. J. Med.* 1952, **247**, 992.
16. Aufderheide, A. C., Horns, H. L., Goldish, R. J. *Blood*, 1953, **8**, 824.
17. Mallory, F. B. *Arch. intern. Med.* 1926, **37**, 336.
18. Social Workers in the Local Authority Health and Welfare Services. H.M. Stationery Office. 1959. Pp. 375. 15*s*. The medical members of the Working Party were Dr. C. M. SCOTT (who took the place of Dr. P. C. MCKINLAY), and Prof. ANDREW SEMPLE.

aged to continue their studies and qualify for one of the other grades. For the " officers with a general training " the Working Party propose theoretical and practical courses in colleges of further education, with the cooperation of the universities. These courses would take 2 years of full-time study and 3–4 years of part-time study combined with practical work. At present there are no courses of this kind, and the Working Party hope that their proposal will offer scope for experiment. But, as an essential rider, they believe that these courses should lead to a national qualification giving the recognition which social workers now too often lack. They would like to see a National Council of Social Service set up which would be responsible for recognising (though not for running) training courses and for establishing the criteria for a national certificate in social work, which in their view would do much to secure standing and status for the social worker and encourage recruitment. Mr. HUWS JONES,[19] himself one of their members, has lately pointed to the necessity for research if social work is to develop as it should. A suitable focus for research, as well as for experiments in training, would be a national staff college. Mindful of past enterprise, foresight, and generosity, the Working Party offer this project to the consideration " of a charitable trust ".

Of the need for recruits there is no doubt. To assess the size of this need the Working Party found harder; but according to their estimates, even if better transport and clerical help are provided, by the end of ten years the local-authority medical and welfare services will require 5550–5700 whole-time workers with a general training and 800 specialists. To achieve these figures, 260 general workers and 105 specialists will have to be recruited each year; and in addition it is recommended that 200 welfare assistants should be recruited in each of the next five years. These figures are admittedly daunting, and there will be little hope of attaining them unless the Working Party's other recommendations—for the review of salary scales—are heeded. Not only do the rates of pay for social workers compare unfavourably with those offered in many other parts of the community, but they contain indefensible anomalies, which sometimes even put the trained worker at a disadvantage with the untrained. The Working Party would like to see many more senior posts created in all branches of the services, and a lengthening salary scale which would give proper recognition to the experience of the person who prefers case-work to administration. At the same time we need not suppose that social service is altogether unfavourably placed for increasing its recruits. It offers work for which maturity and sympathy are valuable qualities, and which can often be suitably done part-time. Many women (and men) who found themselves free to start a new career in middle age might find satisfying opportunities in the Younghusband scheme.

In their proposals the Working Party were naturally mindful of the changes arising from the Mental Health Bill which receives its third reading in the Commons this week. The recommendations of the Mackintosh Committee [20] on social workers in the mental health services seem to have lain mostly dormant; but enactment of the new measure, and the Minister's anticipatory action (p. 996) ,will create a situation in which the responsibilities of the local health authorities, and especially of their social workers, will be much increased. If they are to face these imminent new responsibilities, as well as their multifarious old ones, with appropriate realism, the local authorities will need to consider the recommendations of the Working Party with sympathy and without delay.

19. See *Lancet*, April 4, 1959, p. 719.

## Annotations

### RADIOLOGICAL HAZARDS TO PATIENTS

A COMMITTEE headed by Lord Adrian are undertaking a survey of radiological procedures in this country to estimate the present level of radiation to which the population is exposed. One part of this survey—that dealing with mass miniature radiography—is finished, and the committee thought it advisable to give an interim report [21] before the whole of the investigations were completed. They did so because the hazards of ionising radiation have been much publicised and there was a danger, in the committee's view, that the public might become unnecessarily suspicious and a patient come to harm through his reluctance to be X-rayed. " In particular, the value of mass miniature radiography is so great that it must not be curtailed without good cause, and we think it important therefore to state now that these examinations, properly conducted, make a negligible contribution to the total radiation to which the population is exposed." The gonad doses during mass miniature radiography were found to be less than half those previously reported by Stanford and Vance [22]; and the committee endorse the Medical Research Council's conclusion [23] that mass miniature radiography examinations are a relatively unimportant source of radiation to the gonads.

On the question of risk to those irradiated, the report says that continuation of mass miniature radiography at the present rate could add no more than 20 cases to the annual incidence of 2500 cases of leukæmia: on the other hand, it might produce none at all. An individual who has 10 mass-miniature examinations over a series of years would have his chance of developing leukæmia in any year increased, if at all, from 50 in 1 million to, at most, 51. " We are satisfied that the somatic risk of doses at these levels is, on any interpretation, far outweighed by the benefits of mass miniature radiography." But all unnecessary exposures should be prevented, and the committee endorse the steps already recommended to reduce even the present small dose. They also advise that mass miniature radiography should not be used as a case-finding procedure in children or in pregnant women.

The Adrian survey into the general use of radiology is the most detailed of its kind ever undertaken, and enormous labour is involved. During a selected week, a

20. See *ibid*, 1951, i, 1403.
21. Committee on Radiological Hazards to Patients: Interim Report. H.M. Stationery Office. 1959. Pp. 22. 1*s*. 3*d*.
22. Stanford, R. W., Vance, J. *Brit. J. Radiol.* 1955, **28**, 266.
23. Hazards to Man of Nuclear and Allied Radiations. H.M. Stationery Office, 1956.

record was made of the numbers and types of X-ray examinations, the number of films used, and the apparatus available in all hospitals, chest clinics, dentists' surgeries, and other institutions in Great Britain. A second census, at a different time of year, was made on a random selection of a quarter of the N.H.S. hospitals and chest clinics. This section of the work, which provides part of the basis for assessing the radiation dose, is now completed. At the same time, the dose received by patients in different types of radiological examination has been measured. These measurements involved 5000 examinations in 140 hospitals and chest clinics, chosen to give a representative selection of radiological work throughout the 19 hospital regions of Great Britain. Because each examination on average required 3 X-ray exposures, some 15,000 measurements were made by hospital physicists, each measurement involving the collection of 20 or more items of information. The considerable task of computation is now in progress. A separate investigation is also being carried out to assess the contribution from radiotherapeutic procedures. The results of all these inquiries will be given in the committee's final report.

The interim report states that preliminary results do not suggest a higher figure for the radiation dose due to medical radiology than that hitherto assumed. "It is therefore unlikely that we shall have to recommend a drastic reassessment of the place of diagnostic radiology in medicine and dentistry. We do not, however, know enough about the effects of very small doses, and in stating that the danger in a particular form of examination is negligible, we mean that the potential harm is negligible in comparison to the benefits. Clearly, however, the potential harm must be kept to a minimum in every form of examination." The committee see no reason to doubt the conclusions in the Medical Research Council report [23] that the major contribution to radiation came from a few types of examination. Referring to X-ray examinations of pregnant women, the committee declare that pelvic X-rays should not be undertaken as a routine: when specifically indicated, however, there should be no hesitation about their use. The level of radiation exposure could be reduced appreciably without prejudice to the patient, but a reasonably balanced view was needed. "Diagnostic radiology, by the part that it plays not only in diagnosis but in the correct treatment of the patient, renders immense service to medicine and dentistry. There is no doubt that much individual suffering would follow any unnecessary curtailment of those services."

Added point is given to the committee's remarks about the use of X rays in pregnancy by a report [24] last week of new work by Russell and his colleagues at Oak Ridge National Laboratory, Tennessee. Their findings in mice indicate that the effect of radiation on fertility varies very considerably with age. About two weeks after birth the reproductive cells of female mice were extremely sensitive to radiation, even at low doses. Female mice of this age, exposed to 85r spread over several days, later produced only a single normal litter, and any second litter was of reduced size. Lower doses of 10–25r had a similar result. Newborn mice, on the other hand, seemed resistant to this effect of radiation, even to an "acute" dose of 300r on the day of birth. Despite such heavy doses, these mice produced nine or ten litters each. Dr. Russell believes that the human ovary may be similarly sensitive at a comparable stage of development; and the stage comparable to a two-week-old mouse is thought to be a human fœtus of six months' gestation. If the human ovary does in fact react in the same way, some antenatal X-ray examinations of the abdomen and pelvis might seriously impair the fertility of female offspring.

24. *New York Times*, April 30, 1959.

## RHEUMATISM REVIEW

THE twelfth Rheumatism Review [1] like its forerunners, is comprehensive, compendious, and critical; and to anyone interested in this specialty it will make fascinating reading. Indeed, the scope is such that it deserves a much wider public. It raises the interesting question of just what sort of specialty is "rheumatology" that can cover the ground from acromegaly to rat-bite fever, including on its way such diverse conditions as backache, arteritis, ochronosis, valvular heart-disease, neuropathies, and scleroderma. Rheumatoid arthritis, of course, continues to be the main problem, and the largest part of the review is devoted to this disease. The annual cost of the rheumatic diseases in the United States is estimated at $700,000,000, much of which is attributable to rheumatoid arthritis.

Since the 11th review appeared no major advances in treatment have been recorded; but one new disease—reticulohistiocytosis—has been added to the list of arthritic disorders. The section devoted to probenecid has been expanded from one to four pages, reflecting the success with this drug in the control of gout. As regards experimental studies, collagen has been subjected to the full glare of research, which, however, does not yet seem to have thrown light on the so-called "collagen diseases". Various forms of experimental arthritis are reviewed, but no exact analogue of human rheumatoid arthritis has been discovered. The studies on the "rheumatoid factor" are now so many that even this review throws up the sponge and refers the reader to other reviews. If cures for the various rheumatic diseases are not yet known it is clearly not from want of trying.

## CONVALESCENCE IN ANIMALS AND MAN

THOUGHTFUL veterinarians are no less uneasy about their ignorance of the recovery of animals from surgical injury than are some surgeons about their ignorance of the recovery of their patients. Allam and Martin [2] have studied convalescence particularly in greyhounds and racehorses.

After major operations dogs or horses will begin to walk about almost as soon as they can stand; which is fortunate, for recumbency has adverse effects, such as disturbance of rumen function in the cow leading to bloating, and oliguria which is common in both cows and horses. Little seems to be known about other effects of recumbency in large animals. Except after enterotomy there is seldom any attempt to limit the intake of water or food after operations on animals, and this freedom to eat and drink does not seem to impede recovery. Indeed such dietary freedom may be an important reason why an animal is fit for full activity much sooner after major operations than is man. To some extent an animal has activity forced on it, to reach the water-bowl or trough in the cage or stall; and the free availability of both water and food shortens the period of partial or complete starvation which too often is a feature of the postoperative care of human patients. Most animals stand, move about, and drink and eat within a few hours of major operations.

1. Smyth, C. J., et al. *Ann. intern. Med.* 1959, **50**, 366, 633.
2. Allam, M. W., Martin, J. E. *Ann. N.Y. Acad. Sci.* 1958, **73**, 438.

Their activities may be influenced in some ways by the type of anæsthesia. Intravenous chloral hydrate is commonly used as a general anæsthetic for horses; but sodium pentobarbitone is most commonly used for dogs, and, like ether, it causes severe postoperative thirst. Regardless of the agent animals attempt to stand soon after they become conscious. Horses may eat hay within an hour after operation but do not generally drink water for 6 hours. In animals both bladder and bowel functions are little affected by operation and anæsthesia, urine being passed soon after recovery from the anæsthetic.

Despite this early recovery from operation and anæsthesia, a considerable time is often allowed for the succeeding convalescence. At least in the United States, the working dog is allowed to return to full activity more slowly than is a pet; and the return of a racehorse to full training activity may be delayed for from 4 to 7 weeks. Allam and Martin found that the return to full activity is slower in horses than in dogs. They suggest that this is not due simply to size of body, because goats and cows recover equally rapidly, but rather to other factors unrelated to the actual injury or to species. The training programme of a racehorse is more carefully regulated than that of a greyhound, and it is natural to be more conservative in managing the convalescence of a racehorse worth 25,000 dollars than of a greyhound or retriever worth only 100 dollars.

Similar wide variations in the duration of convalescence in human patients have been detected. Saffeir [3] has collected data on people covered by group insurance policies paying benefit during convalescence from operations. In men the average duration of absence from work was 3 weeks after hæmorrhoidectomy, 6 weeks after hernia operations, and 3–4 weeks after appendicectomy; in women all the absences were longer, and in both sexes there were large variations. Men employed in heavy labour had a convalescence 50% longer than those in light work. Convalescence took about a week longer at the age of 65 than at 25, regardless of the nature of the operation; but the duration was not related to the value of the weekly benefit, to the normal wage, or to the difference between wage and benefit.

Apart from complications, the opinion of the general practitioner is often the most important factor in determining the duration of convalescence. There is, however, wide diversity of opinion among doctors about how long convalescence should last, although no-one seems to have laid down any definitions of when convalescence should end and opinions are based on impressions and not on objective evidence. Moss and Dohan [4] sent a questionary to over 200 surgeons, industrial medical officers, and general practitioners and found that after appendicectomy the delay recommended before returning to light work varied from 5 to 30 days and averaged 14 days, and for heavy work varied from 7 to 60 days and averaged 28 days. After a hernia operation in a patient aged 50 years the delay recommended before starting light work varied from 7 to 84 days, and for heavy work from 21 to 180 days. Yet members of the United States Air Force and Navy return to active and strenuous training after a delay about only a third as long. Some surgeons get their patients out of bed early after operation and keep them in hospital for only a few days, but then are unwilling to let them return early to work. Moss and Dohan studied a hundred patients who made uncomplicated recoveries from nine different surgical and gynæcological operations of moderate severity. At the time of starting work well over half the patients felt perfectly well, and only a few felt even moderate disability. Fatigue was the commonest complaint, and Moss and Dohan think that this might have been lessened by greater activity during convalescence. The surgeon seldom gave any instructions or advice regarding such activity.

Some sensation of fatigue is an inevitable sequel to an operation or general anæsthetic, but at least part of the tiredness experienced on returning to work may be due to "softness" consequent on convalescence and is probably largely avoidable. Since there can be little doubt that the doctors' *fiat* regarding the date of return to work has a powerful influence on the patient's behaviour, more attention should be given by general practitioners and surgeons to the detailed conduct of convalescence. The first requirement seems to be further information about the duration and mode of convalescence after common operations on men and women in the most active years of life.

3. Saffeir, H. J. *ibid.* p. 444.
4. Moss, N. H., Dohan, F. C. *ibid.* p. 455.

## HOSPITAL GROUP PHARMACY

A MINISTRY circular [1] on hospital pharmaceutical departments, issued last week, deals with organisation on a group basis. It may be regarded as a supplement to the Linstead report of 1955.[2] The new circular is based on a report by a subcommittee of the Standing Pharmaceutical Advisory Committee, under the chairmanship of Sir Hugh Linstead. This report said:

"Generally speaking the pharmaceutical service cannot be satisfactorily planned only on a one-hospital basis. This is particularly true in the case of hospitals for specialities such as maternity, ear, nose and throat or eyes. They do not and should not provide the wide diversity of services which the pharmaceutical department of a large general hospital is called on to offer. Nevertheless those services should be obtained with reasonable facility in the occasional case when they are needed. The natural basis for organising it is the hospital group and the distribution of pharmacists and ancillary staff should normally be arranged on this basis. Exceptionally, circumstances may call for the organisation of services on an inter-group basis, where, for example, there are hospitals with strictly limited pharmaceutical needs. Conversely, there may be a few cases where large groups will have to organise their services on the basis of a part of the group."

The Minister is stated to be in general agreement with this view, and most pharmacists are likely to endorse it. Such arrangements seem to be a corollary of the grouping of hospitals under the National Health Service; and in many cases they already exist. When the N.H.S. was started in 1948, many chief pharmacists were appointed as group pharmacists by their boards or committees, and others have undertaken group duties without any recognised status. This type of organisation has proved its worth. Where there are one large hospital and several small ones, the chief pharmacist of the largest hospital may rationally be appointed group chief pharmacist, since he is usually the best qualified and most experienced pharmacist in the group and his pharmacy is generally the best equipped. But where a group includes two or more general hospitals of approximately equal status, difficulties are likely to arise. In such a group it may be more convenient to constitute the chief pharmacists of the major hospitals as a committee to organise the pharmaceutical service on a group basis, rather than to risk dissension by

1. H.M.(59)43.
2. Ministry of Health, Central Health Services Council: Report of the Subcommittee on the Hospital Pharmaceutical Service. H.M. Stationery Office, 1955. see *Lancet*, 1955, i, 572.

the appointment of a single pharmacist as group officer. The Ministry makes it clear that such arrangements are permissible provided that the service is organised for the benefit of the group as a whole. The group arrangement can be of particular value to hospitals too small to have a full-time pharmacist, and it can also realise the recommendation of the Joint Subcommittee on the Control of Dangerous Drugs and Poisons in Hospitals [3] that "No hospital should be entirely without the services of a pharmacist."

The circular emphasises that the group chief pharmacist should consult his colleagues and have special regard to the position of other chief pharmacists in the group, and it draws attention to the statement in the original Linstead report that, in creating a group pharmaceutical service, as much freedom as possible should be left to the chief pharmacist of the individual hospital. This may help to allay the fear of some chief pharmacists that, under the group system, they would lose their professional freedom and be subjected to irksome control by the group pharmacist.

The circular says that to use pharmacists on work not requiring their special knowledge and training is wasteful, and it points out that the proper use of assistants-in-dispensing and other ancillary staff can ensure an efficient and economical service and enable the pharmacists to concentrate on truly professional work. It adds that, as far as practicable, each section of the work should be supervised by a pharmacist; and clearly the employment of so many assistants that proper supervision will not be feasible is not contemplated. Another valuable suggestion is that ancillary staff should remain long enough in the department to become thoroughly familiar with their duties. Too often the pharmacy has had to make do with the occasional help of porters and cleaners from a common pool, and of clerical staff unaccustomed to pharmaceutical terms.

The re-emphasis of the Linstead report's recommendation that "every opportunity should be taken to encourage both pre-graduate and post-graduate students of pharmacy to obtain their practical experience in hospitals" is important. The establishment of an adequate number of posts for such training is essential in order to ensure that there are enough entrants to hospital pharmacy, which has already been deprived of many valuable recruits because of shortsighted policies. The circular also recommends the appointment of permanent pharmaceutical advisory committees in each region. This important suggestion should be immediately followed; for where such committees already exist they have given valuable advice.

Finally, the circular states that the Whitley Council will consider the allowance to be made to the group pharmacist. This should not be done in isolation. If the hospital pharmaceutical service is to be saved from its present downward trend, the whole salary structure should be reappraised, and a career value given to all grades. The application of the scales should be much less rigid than in the past, and hospital authorities should be freer to make suitable awards for special responsibility or special merit. Many young pharmacists who would like to make hospital pharmacy their career feel unable to do so under present conditions. Implementation of the two Linstead reports will ensure adequate status; and, if the Minister can persuade the Whitley Council to give a more suitable career value to hospital pharmacy in recognition of the long training and high academic standards necessary for qualification as a pharmacist, he will find that the problem of staffing has been solved, and the service as a whole will become more stable and efficient.

3. Ministry of Health, Central Health Services Council: Report of the Joint Sub-Committee on the Control of Dangerous Drugs and Poisons in Hospitals. H.M. Stationery Office, 1958. see *Lancet*, 1598, i, 422, 487.

## FROM THE WELLCOME TRUST

THE first report of the Wellcome Trust in 1956 covered twenty years (1937–56) and recorded the allocation of just over £1 million. The second, published this month,[1] covers only two years (1956–58), but records the allocation of about the same sum. Unlike most anomalies, this one is encouraging; the quickening tempo of the Trust's work and the steady and assured interpretation of its policy confirm the value of the earlier years of unobtrusive preparation.

According to Sir Henry Wellcome's will, the Trust supports research in human and animal medicine and the history of medicine, and museums and libraries serving medical research and medical history. In translating these general aims into grants, buildings, and equipment the trustees have during the past two years sanctioned fifteen building projects including:

A Wellcome annexe, Institute of Clinical Research, Middlesex Hospital (£11,000); two new wings to the research block of the Institute of Orthopædics at Stanmore, Middlesex (£43,000); an extension to the clinical research block at the Queen Elizabeth Hospital, Birmingham (£95,000); extensions to the laboratory and animal accommodation for the department of anatomy, University of Birmingham (£36,500); a research floor with animal accommodation in the extension of St. Mary's Hospital Medical School, London (£70,000); a sprue research unit at the Christian Medical College Hospital, Vellore, South India (£10,000); a Wellcome laboratory of pharmacology and experimental chemotherapy in the extension to the Chester Beatty Research Institute, London (£40,000); Wellcome research laboratories of experimental medicine and surgery at the Royal North Shore Hospital of Sydney, New South Wales (£17,000); research laboratories for the departments of neuroendocrinology and of neuropathology, Institute of Psychiatry, London (£37,000).

A motor cruiser is an unusual piece of research equipment, but the *Lady Dale*, given to the Medical Research Council at a cost of £26,000 and named by them after the wife of the chairman of the trustees, has proved her worth on the Gambia as a floating laboratory for field investigations and as a link between the main laboratories at Fajara and branch laboratories upstream. Other equipment provided by the Trust as gifts or on indefinite loan are:

A Gibbon-Mayo pump-oxygenator and accessories, Nuffield Department of Surgery, Oxford (£18,000); electron microscopes to the London Hospital Medical College, St. Bartholomew's Hospital Medical College, Birmingham Medical School, the University of Edinburgh (department of anatomy), the University of Oxford (Sir William Dunn School of Pathology), London School of Hygiene and Tropical Medicine, and the M.R.C. Biophysics Research Unit, King's College, London (total cost £81,500).

During the past two years the Trust has made no grants for the construction of medical research museums, but it has given help to medical research libraries in London, Montreal, Liverpool, and Edinburgh.

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THE next session of the General Medical Council will open on Tuesday, May 26, at 2.15 P.M., when Sir David Campbell, the president, will deliver an address. The Disciplinary Committee will sit on Wednesday, May 27, at 10.30 A.M.

1. Obtainable from the Trust, 52, Queen Anne Street, London, W.1.

# Conferences

## B.C.G. VACCINATION

THE Health and Welfare Department, and the Chest Clinic Service, in Glasgow organised a combined conference on B.C.G. vaccination, which was held on Feb. 13.

Dr. W. A. HORNE, medical officer of health for Glasgow, welcomed the opportunity of discussing a subject of vital importance in the plans for the eradication of tuberculosis. More than a quarter of a century had elapsed since B.C.G. vaccination was introduced and despite the fact that more than 100 million people had been vaccinated, there was basic disagreement on its value as a preventive measure. Opinions varied about the interpretation of field studies, about the usefulness of the vaccine in different countries and in different population groups, about the most acceptable age for vaccination, and about the incidence of significant complications in different age-groups. It seemed appropriate, therefore, at a time when the most exact endeavours in tuberculosis control were necessary, to review some of the intriguing problems involved in the use of the Calmette vaccine.

### INDICATIONS FOR VACCINATION

Dr. P. M. D'ARCY HART discussed indications for B.C.G. vaccination at different ages in different countries. While the earlier fundamental doubts of B.C.G. vaccination in man had been allayed, epidemiological circumstances might greatly affect the applicability of the vaccine. In the United Kingdom single vaccination at age 13 was practised; in provincial Denmark it was proposed to use isoniazid prophylaxis in tuberculin-positives in conjunction with a rather similar scheme. In Sweden the plan was to continue vaccination in infancy and to revaccinate if necessary at school. In the U.S.S.R. vaccination was from "cradle to manhood": in the U.S.A. only by private enterprise and little at that.

First among the policy-forming epidemiological-immunological factors was the protective efficacy of B.C.G. in the tuberculin-negative, which was the basic consideration: it was about 80% in the first report of the M.R.C. trial. But this was not enough, since the total benefit to a community must be known—i.e., the percentage reduction in tuberculosis to be expected, taking account also of the tuberculin-positive candidates ineligible for vaccination: so far this reduction was about 50% in the M.R.C. trial. As a corollary, the prevalence of natural tuberculin positivity at different ages was important; this figure was changing rapidly in many countries. In this connection, any single-vaccination policy should be planned for an appropriate age in order to anticipate the natural acquisition of tuberculosis at a dangerous period of life; on that score there could be argument in favour of reducing the age somewhat in Britain, but none for dropping the present scheme at the present time. Another important consideration was the tuberculosis notification-rate at relevant ages (the 3000 cases of all forms of the disease in England and Wales in 1957 at ages 15–19—the relevant ages when vaccination is at age 13—shows the target for reduction by vaccination and all other means). In areas of the world where low-grade tuberculin sensitivity was very common, this might come into the picture, particularly if associated with some degree of natural antituberculous immunity.

Dr. Hart discussed the interconnection of chemoprophylaxis and B.C.G. policies, and he pleaded for a national scheme to provide a running assessment of the current British official B.C.G. scheme, making use of the controls provided by those areas that still did not have inclusive cover and by the non-volunteers in every area.

### B.C.G. IN SCOTLAND

Discussing B.C.G. vaccination in Scotland, Dr. IAN MACGREGOR said that the programme in Scotland started in 1949 with the import of Danish liquid vaccine. In 1952 a number of local health authorities were authorised to extend the arrangements beyond nurses, medical students, and contacts to those nearing school-leaving age.

The estimated number of vaccinations performed by the end of 1958 was 350,000. For every new case of tuberculosis there were, on average, 2 contacts tuberculin-tested and 1 of these was vaccinated. The response among school-leavers was about 70%. The proportion of negative reactors among school-leavers has risen from 44% (1952) to 73% (1957).

Dr. Macgregor gave figures showing, for selected areas, the actual age of new notifications between 10 and 25 years of age in the sexes separately. Following a sharp incline after the age of 13 the peak incidence was at 18 years in the early 1950s with a move towards later years in the more recent data. To obtain maximum benefit from B.C.G. vaccination it must be applied before this increase began, but not so early that there was a danger of protection being lost before the age of maximum risk.

The medical officers of health of Renfrewshire, Paisley, and Greenock had cooperated in a study designed to assess the incidence of tuberculosis among 13-year-old children during subsequent years. The rate of new notifications among those not initially participating in the scheme (i.e., no record of participation could be traced) was 1·641 per 1000 person-years, among those initially tuberculin-positive 0·906 per 1000 person-years, and among those vaccinated 0·116 per 1000 person-years. The advantage to persons vaccinated was statistically significant.

### OPTIMUM AGE FOR MASS VACCINATION

Dr. T. M. POLLOCK said that, in the United Kingdom, vaccination for non-contacts was available for 13-year-old children only. By 13 years of age, however, many children had become tuberculin-positive and were not eligible for vaccination. Moreover, the subsequent incidence of tuberculosis among children found to be tuberculin-positive in adolescence was considerable. This incidence would probably be reduced by vaccination at an earlier age. One of the reasons for giving the vaccine at 13 years was uncertainty concerning the duration of protection conferred by B.C.G. Such information as was available, however, suggested a long rather than a short period of protection after vaccination.

If an estimate of 10 years' protection after vaccination were accepted, it had to be appreciated that B.C.G. given to the 10-year-old group now would protect until 1969. If, on the other hand, vaccination were withheld until the current 10-year-old age-group had become 13, they would be unprotected in the immediate future but there would be the advantage that protection would extend for longer—until 1972. Was it more desirable to be protected against tuberculosis now, or to forgo protection now in favour of protection in ten years' time? Tuberculosis was declining, so protection now seemed preferable to protection at the end of a decade.

The notification-rates suggested that the age-group 15–25 years was the one principally at risk; but a considerable period often elapsed between an infection with tubercle bacilli and the eventual detection and notification of the disease produced. Thus many cases of tuberculosis appearing in the 15–25 age-group probably arose from infections sustained earlier than 13.

Puberty and adolescence was a relatively dangerous time to sustain a first tuberculous infection. Dr. Pollock therefore suggested that the age of 10, immediately before puberty, would be the best time to give the vaccine at present. All aspects of the mass application of B.C.G., however, should be regularly reviewed. The incidence of tuberculosis in very early life was declining rapidly.

It was doubtful, therefore, whether the vaccination of infants was now justified on a national scale.

### COMPLICATIONS

Dr. J. S. GEMMILL reviewed B.C.G. vaccination in Glasgow and complications at different ages.

In Glasgow, vaccination began in 1950 among contacts, nurses, and medical students, was extended in 1952 to newborn infants in two (later seven) maternity hospitals, and in 1953 to schoolchidren aged 13, as well as other smaller groups. The annual total of vaccinations has risen from some 400 to over 20,000, and in 1958 the aggregate passed the 100,000 mark.

Tuberculous meningitis had nearly reached vanishing point. In the five years, 1952–56, following the extension of the scheme to infants, its decline had been almost three times faster than in 1947–51, and the accelerated rate of decline continued. During 1954–58, there were 516 notified cases of phthisis at ages 14–18. Of these, 499 came from 41,000 scholars whose tuberculin reaction was either positive or undetermined, while only 17 came from almost 40,000 B.C.G.-vaccinated scholars.

The incidence of complications was estimated from almost 20,000 newborn infants vaccinated in hospitals during 1952–56, and from 24,000 children aged 13 vaccinated in schools during 1953–55. Complications could be classified according to site in 3 groups (A, B, and C), or according to type in 2 groups, papular and glandular (A and B + C), as shown in the accompanying table of incidence and distribution.

COMPLICATIONS OF B.C.G. VACCINATION

| — | | At birth | | At 13 years | |
|---|---|---|---|---|---|
| Period | | 1952–56 | | 1953–55 | |
| Vaccinations | | 19,720 | | 23,961 | |
| Complications | | 329 | | 30 | |
| Incidence | | 1·67% | | 0·12% | |
| Distribution | | | | | |
| Group | Type | | | | |
| A. Focal (Papule) | 1. Abscess | 46 | (0·25%) 49 (15%) | 22 | (0·10%) 25 (83%) |
| | 2. Polyp | 3 | | 2 | |
| | 3. Lupus | – | | 1 | |
| | 4. Eczema | – | | – | |
| B. Intermediate. (Glands) | Adenitis | 11 | (0·06%) | – | |
| C. Regional. (Glands) | Adenitis | | 280 (85%) | | 5 (17%) |
| | 1. Axillary | 232 | (1·36%) | 4 | (0·02%) |
| | 2. Cervical | 31 | | 1 | |
| | 3. Subclavian | 6 | | – | |
| | | 329 (1·67%) | | 30 (0·12%) | |

In newborn infants the incidence of adenitis (1·42%) was not excessive, but abscesses formed in 75% of these cases and required incision. The onset of adenitis showed a preference for the second month after vaccination and 73% appeared within four months. The longest interval was 4 years 2 months.

At 13 years, the total incidence of complications (0·12%) was less than one-tenth of that in early infancy. Moreover, the type-incidence underwent complete inversion, 83% of the total being papular at this age, compared with only 15% in infancy, while only 17% were glandular, compared with 85% in infancy.

### "SECOND-CLASS" IMMUNISATION?

Prof. TOM ANDERSON remarked that despite the reasonable success of B.C.G. vaccination in the field trial, this form of vaccination was much less satisfactory from many points of view than the measures used against, for example, diphtheria, tetanus, or poliomyelitis. It might be fair to describe it as a "second-class" form of immunisation, of value when the situation, in the individual or in the community, was so serious as to demand the use of every available weapon, but to be discarded if possible when other measures proved effective. He believed that there was great need to keep under review the conditions against which immunisation procedures should be carried out as a routine. All infectious disease was a reflection of the interaction of host, parasite, and environment, and alterations in any of these would change the disease pattern. He believed a stage was being reached when the time and money presently devoted to B.C.G. vaccination would be better deployed upon a policy of more rigorous case-finding and continued contact examination. We must beware of accepting an imaginary Canon Law that immunisation by artificial means was always a good thing.

### CHEMOPROPHYLAXIS

Dr. J. E. GEDDES mentioned that the symposium had been organised to consider controversial problems in the use of the vaccine and the related question of chemoprophylaxis, particularly in recent Mantoux convertors. Chemoprophylaxis might deserve a place in the present scheme of control and, even more so, when the incidence of tuberculosis had fallen so low that B.C.G. vaccination was redundant. There was need, however, to determine the quality of the resultant immunity with chemoprophylaxis in the wake of a tuberculous infection; the possible emergence of resistant bacilli with a practice of chemoprophylaxis in recent Mantoux convertors; and the overall clinical effectiveness of chemotherapy where the efficiency of the drugs might be prejudiced by a sluggish metabolic state of the bacillus.

## THE NEUROMUSCULAR JUNCTION

A SCIENTIFIC meeting of the Faculty of Anæsthetists was held in London at the Royal College of Surgeons on May 2.

### TEMPERATURE AND NEUROMUSCULAR BLOCK

Prof. E. J. ZAIMIS (London) described the considerable influence of temperature on the response of muscle to neuromuscular blocking agents. A lowering of muscle temperature from 36° to 30°C increased the blockade caused by suxamethonium or decamethonium both in magnitude and in duration, whereas that due to tubocurarine was reduced. Presumably the effectiveness of acetylcholine was increased on cooling. This would explain why depolarising drugs such as suxamethonium became more effective and curare-like drugs which competed with acetylcholine became less efficient.

Limb temperature was often surprisingly low in the theatre and rectal temperature might be misleading. In the U.S.A. where theatres were deliberately kept cool in hot weather it was not unusual for prolonged suxamethonium blockade to be ended merely by wheeling the patient from the theatre into the warmer recovery-room. On the other hand, with a curare-like relaxant the transfer from the cool theatre to the recovery-room could be followed by re-curarisation. In prolonged suxamethonium blockade attention should be given to the patient's temperature, and warming should be tried as a remedy. Professor Zaimis was critical of the "dual-block" conception where a neuromuscular blockade induced by a depolarising relaxant could be reversed by neostigmine, which was an antidote in neuromuscular blockade induced by competitive drugs. The relevant observations had been based on the measurement of respiration-rate, a function which was influenced by many factors: it was necessary to investigate the muscles themselves. In studies of the human diaphragm she had never been able to demonstrate antagonism by neostigmine or edrophonium ('Tensilon') to suxamethonium. Even if such an antagonism could be demonstrated for a small group of muscles, this could not justify the claim that dual block was of general importance. There were considerable differences in response to suxamethonium between different groups of

muscles, and the recovery of the calf muscles from a suxamethonium block could be uneven. In dogs edrophonium counteracted suxamethonium in the tibialis muscle but not in the diaphragm. If dual block existed in man at all it had not yet been demonstrated in the great majority of muscles and therefore its practical importance in human anæsthesia had not been proved.

### MECHANISM OF BLOCK

Dr. H. C. CHURCHILL-DAVIDSON (London) described five types of neuromuscular block:

(1) Depolarising block induced by methonium compounds, such as suxamethonium or decamethonium.

(2) Non-depolarising block in which curare or curare-like compounds, such as tubocurarine, competed with acetylcholine. This block could be antagonised by neostigmine.

(3) Block brought about by interference with acetylcholine production. That following botulinus toxin was an example.

(4) Mixed block caused by a simultaneous application of depolarising and non-depolarising drugs.

(5) Dual block, where a depolarising drug produced a non-depolarising type of blockade which could be counteracted by neostigmine.

Like Professor Zaimis, Dr. Churchill-Davidson did not think that the measurement of tidal volume was adequate to determine the action of neuromuscular blocking agents. By that method pethidine might well be taken to be a depolarising drug! He had measured neuromuscular blockade by determining changes in action currents. A maximal electrical stimulus was applied to a nerve and the muscular response was observed in an electromyogram. By this method he was able to distinguish between depolarised and competitive block. In the first, twitches in tetanus were maintained at a reduced but constant level, there was no post-tetanic facilitation—i.e., when a single stimulus was applied following a tetanic stimulus the single twitch was not increased in magnitude. When neostigmine was given the block became more pronounced, the muscular response diminished in magnitude—it " faded ". In the competitive block the potential was not maintained on tetanic stimulation—it " faded ". Following tetanic stimulation a single impulse caused a larger response than usual—i.e., there was post-tetanic facilitation. (Post-tetanic facilitation was not entirely specific for non-depolarising block, but could be seen *occasionally* in normal muscle.) When neostigmine was given, the non-depolarising block was reversed and the fading types of response to tetanic stimulus and post-tetanic facilitation were abolished. By using the electromyograph the type of block could thus be diagnosed. It was not necessary, however, to use a complicated electromyograph. For practical purposes simple electric stimulation of the ulnar nerve and observation of the finger movements could demonstrate the type of block. When suxamethonium was given for long enough a change of the depolarised type of block into the non-depolarised type could be demonstrated. Sometimes as little as 500 mg. of suxamethonium chloride was sufficient; on other occasions as much as 2 g. had to be administered. He had seen this now in some 10 patients, and it was only a question of going on long enough with the suxamethonium. This change of one type of block into the other constituted the " dual block ".

Dr. Churchill-Davidson doubted whether a non-depolarised type of block could ever be truly resistant to reversal by neostigmine. In circulatory failure it might take longer for the drug to reach the nerve endplates. He gave an example in which neostigmine took 15 minutes to act under such circumstances. The claim that hexamethylene bis-1 : 6-carbaminoylcholine bromide (' Imbretil ') was antagonised by neostigmine was, he thought, based on observations made following dual block. He had administered 1·4 mg. to a conscious volunteer. The electromyograph showed a depolarising type of response and repeated administration of edrophonium increased rather than counteracted the blockade.

### NON-CLINICAL BLOCKING AGENTS

Discussing non-clinical neuromuscular blocking agents, Mr. R. HOLMES (Porton Down) said botulinus toxin interfered with the release of acetylcholine, and magnesium competed with the effect of calcium on endplate activity. Organophosphorus compounds were widely used as insecticides. They inhibited cholinesterase and caused " acetylcholine poisoning ". They potentiated the response to muscle stimuli. A single impulse caused several twitches because of the high level of acetylcholine. A tetanic response could not be obtained, however, because re-depolarisation was not possible.

### ORGANOPHOSPHORUS POISONING

Dr. W. S. S. LADELL (Porton Down) described the treatment of organophosphorus poisoning. There were four lines of protection against anticholinesterase poisoning: (1) protective ointments and clothing; (2) prevention of toxic action (atropine); (3) control of toxic effect (artificial respiration, &c.); (4) reversal of toxic action (oximes). When absorption had taken place through the skin, atropine should be given continuously over several days because absorption could continue for that time. Anticholinesterases conferred resistance to atropine and very large amounts of the drug could safely be given. If signs of atropine poisoning were noted after doses of as little as 10 mg., anticholinesterase poisoning must have been slight. In one case of attempted suicide 25 ml. of 35% parathion had been swallowed and promptly vomited, but 8 lethal doses had been retained. 354 mg. of atropine was given over the next 24 hours with success. Pressor agents, such as noradrenaline, had been applied as symptomatic treatment and barbiturates given to reduce convulsions. Violent movements were liable to increase acetylcholine production. The latest contribution to therapy were oximes which dephosphorylated the cholinesterase and thus reconstituted the enzyme. In animals up to 30 lethal doses of organophosphorus poison could be counteracted by a combination of atropine and oxime. Pyridine 2-aldoxime methiodide (P.A.M.) was widely investigated, but pyridine 2-aldoxime methylmethane sulphonate (P.A.M.S.) was more soluble. Oximes were short-acting, they were partially hydrolysed in the liver, and much was excreted by the kidney. They did not pass the blood-brain barrier, and they had no effect on the poisoning of the central nervous system even if injected into the 4th ventricle. A mobile team at Porton could now go anywhere at short notice to treat cases of insecticide poisoning.

### PANEL DISCUSSION

A panel under the chairmanship of Prof. W. W. MUSHIN (Cardiff) answered questions. Dr. T. C. GRAY (Liverpool) strongly deprecated the mixing of different types of relaxants, but Dr. CHURCHILL-DAVIDSON maintained that suxamethonium was invaluable for intubation and that it should precede whatever relaxant was used for the subsequent operation. He would, however, abandon it if a non-depolarising relaxant became available which was short-acting. Dr. C. F. SCURR (London) remarked that

the role of potassium had not been sufficiently considered in its relation to muscular action after the application of blocking agents, and there was ample scope for research.

## MEDICAL RESEARCH IN THE BRITISH CARIBBEAN

THE fourth annual meeting organised by the Standing Advisory Committee for Medical Research in the British Caribbean was held in Georgetown, British Guiana, on April 5 and 6. The chair was taken in succession by Sir GEORGE PICKERING (Oxford), Prof. J. GILMOUR (University College of the West Indies, Jamaica), Dr. R. LEWTHWAITE (Colonial Office), and Prof. A. C. FRAZER (Birmingham).

### Disease in Children

Dr. F. M. WILLIAMS (British Guiana) discussed the pattern of pædiatric practice in British Guiana as seen in the Georgetown Hospital; and Dr. E. BACK (University College of the West Indies) considered the pattern of disease in childhood in Jamaica.

In both countries malnutrition is the most important factor in the under-2-year age-group; gastroenteritis and respiratory infections are other important causes of death in this group. Over the age of 2 years the picture changes; both malnutrition and gastroenteritis become relatively unimportant, and there is a wide range of diagnoses similar to that found in temperate countries.

### Tropical Eosinophilia

Tropical eosinophilia in British Guiana was discussed by Dr. F. M. WILLIAMS, Dr. BALWANT SINGH, and Dr. H. HAMILTON. The condition is relatively common and may become chronic. It occurs mainly in the East Indian race, among both adults and children.

Dr. H. HERLINGER (British Guiana) said that in 86% of 150 proven cases a confident radiological diagnosis could be made. The common findings were increased striation and reticulation, lung-field haziness, and hilar-gland enlargement. He suggested that prominence of the lymphatic vessels on the surface of the lung and within its substance was mainly responsible for the X-ray changes. Clinical improvement always preceded radiographic improvement.

### Skin Diseases

Dr. G. H. WATTLEY said that the commonest skin diseases seen in South Trinidad were tropical ulcer, eczema, tinea, verruca, scabies, and Hansen's disease; the ulcers were mainly of undetermined origin.

### Eye Diseases

The eye diseases commonly seen in British Guiana were described by Dr. E. R. ASREGADOO and Dr. W. C. G. MURRAY. The five common conditions are epidemic keratoconjunctivitis (this is most common among sugar-estate workers), glaucoma, pterygium, optic atrophy, and cataract. Glaucoma and optic atrophy are seen mainly in the Negro. The optic atrophy is regarded as a manifestation of deficiency of the B complex vitamins, and treatment with this complex within a month of the onset is associated with a high recovery-rate.

### Ruptured Ectopic Pregnancy

Dr. W. B. MARKOWSKI (British Honduras) described his experience with 104 consecutive cases of ruptured ectopic pregnancy. This was a common condition, being found in 1 in 35 pregnancies; and it is almost certainly related to pre-existing pelvic inflammatory disease. Of the 104 patients, 3 died on their way to hospital, 1 died postoperatively, and 100 recovered.

### Poliomyelitis

Prof. J. L. MELNICK (U.S.A.) reviewed the pattern of poliomyelitis immunity in the West Indies. Antigua and Barbados show a high immunity to all three types of virus. In British Guiana immunity is also widespread, and among the Amerindian population there is 100% immunity to all three viruses. British Guiana experienced its first epidemic of poliomyelitis in 1957, when 69 cases were noted with no deaths. This epidemic, which was mainly due to virus types I and II, mainly affected children under 5 years of age.

Experience in St. Lucia was described by Dr. A. V. WELLS. Immunity to all three viruses is common, but immunity to type-II virus is most prevalent and to type-III virus least prevalent. In Castries the proportion of antibodies to all three viruses is greater than in the other parts of the island. St. Lucia has never experienced a poliomyelitis epidemic, but there have been a few sporadic cases.

### Diarrhœa in Infants

Dr. B. B. G. NEHAUL (British Guiana) reported bacteriological findings in infantile diarrhœa. 54% of the cases were due to a shigella infection, and *Shigella sonnei* was the common type. Salmonella infections were found in 19% of cases, and coliform infections in 24%.

In-vitro resistance to sulphonamides of Sonne dysentery cultures was reported by Dr. D. C. TURK (University College of the West Indies). He found resistance in 22 out of 24 *Sh. sonnei* strains. The findings, therefore, suggest that if antibacterial therapy is thought to be necessary in a *Sh. sonnei* infection, antibiotics rather than sulphonamides might be used.

### Leptospirosis

Leptospirosis in Jamaica was discussed by Prof. G. BRAS and Dr. D. MACINTOSH. 21 proven cases were admitted to the University College of the West Indies between 1953 and 1958. The disease was severe, and 3 patients had hæmoglobinuria. There were 8 deaths. Treatment with tetracycline in high dosage appeared to be useful.

### Filariasis

Dr. H. B. EDGHILL and Dr. W. ADAMS (British Guiana) said that the incidence of filariasis is high where there is overcrowding of people and of latrines. The mosquito vector, *Culex fatigans*, breeds in waterlogged latrines. Diethylcarbamazine citrate greatly reduces the carrier-rate and frequently reduces the microfilarial count in the blood to the critical level of 4 per 20 ml. of blood—a level under which the patient is almost certainly non-infectious.

### Hookworm

Dr. G. GIGLIOLI, medical adviser to the British Guiana Sugar Producers' Association, reported on the decreasing incidence of hookworm in British Guiana. Infestation-rates were previously very high. This year, however, infestations which might be of clinical significance were noted in only 0·8% of all persons examined, and in the children. Although hookworm infestation has decreased so remarkably, the ascaris infestation-rate has increased quite considerably.

### Gastric Lesions

In British Guiana, carcinoma of the stomach is common among Africans and relatively infrequent among East Indians. Mr. A. ST. F. HENLEY reported that only 25% of his cases were fit for resection.

Prof. J. GILMOUR (University College of the West Indies) said that, in experienced hands, cytological examination was 90% accurate in diagnosing gastric neoplasia, and it can reveal the presence of malignant disease before there is radiographic or gastroscopic evidence of this.

Chronic peptic ulcer is common in the Caribbean area. In many cases long-continued medical treatment is impossible; and operation is, therefore, commonly undertaken. Mr. N. GREWEL (British Guiana) gave a preliminary report on the follow-up of cases treated by partial gastrectomy. Of 71 such cases, the result was good in 46, fair in 20, and bad in 5. The classical dumping syndrome has not been seen. The results suggest that surgical treatment of chronic peptic ulcer is worth while in this area.

The possible role of hookworm in the ætiology of chronic peptic ulcer was suggested by Dr. S. P. W. STREET (Jamaica). He suggested that vigorous treatment of hookworm infestation is essential in the management of a patient with peptic ulcer, and that the consequent improvement may obviate the need for surgical treatment.

# Special Articles

## RADIOACTIVE FALLOUT

### Prime Minister's Statement

IN reply to a question in the House of Commons last week, the Prime Minister said that even if deposition of strontium 90 ($^{90}Sr$) already injected into the stratosphere continued at the higher rate observed in the summer of 1958, the concentration of $^{90}Sr$ in human bones was unlikely to approach the level which the Medical Research Council advised in 1956 would require "immediate consideration". Mr. Macmillan had asked his advisers to prepare a statement on this matter, and we publish below some points from this document.

*Rate of Fallout*

Measurements since May, 1958, had indicated a general rise in the rate of deposition of $^{90}Sr$ and other isotopes, involving an approximate doubling of the rate in rainfall in the United Kingdom.

Analysis of fallout material had shown that $^{90}Sr$ could remain in the stratosphere for many years before being deposited on earth. The United Nations Scientific Committee on the Effects of Atomic Radiation decided that a mean residence time of about 5 years seemed to be the best value and a reasonable upper limit was about 10 years. It had recently been suggested, notably by the U.S. Department of Defence, that the residence time of radioactive materials in the stratosphere has been overestimated. If this were true, it would confirm that the estimates made by the United Nations committee were unnecessarily pessimistic, since there would be less of this material at present in the stratosphere than they estimated. A shorter residence time would mean that the radioactivity would have had less time to decay before the fallout was deposited; but $^{90}Sr$ decayed so slowly that the difference would be very small. There would also be an increased amount of shorter-lived fission products in the fallout, but the increase in the dose to body tissues from these would also be relatively small.

Heavy rain tended to produce enhanced fallout, and that was certainly one of the factors responsible for the higher recorded measurements of fallout in the summer of 1958. In subsequent months, however, in which the rainfall in the United Kingdom was more nearly normal, the data so far available indicated that the rate continued high. There was evidence from the nature of the radioactive material deposited that this was likely to have been due to recent tests, presumably those conducted in the autumn by the U.S.S.R., the fallout from which possibly occurred more rapidly because they took place in high latitudes. The "Argus" experiments conducted about the same time by the United States were understood to have been three low-yield nuclear explosions at great heights; they therefore resulted in only a very small addition to the radioactivity already in the stratosphere.

*$^{90}Sr$ in Diet*

Results of the food survey for 1958 indicated that, although the extent of contamination varied between different parts of the country, the amounts of $^{90}Sr$ in food and drinking-water were well below those which were likely to give rise to concentrations in human bone which, in the words of the M.R.C. report, would require "immediate consideration". The quantity of $^{90}Sr$ in human diet in the United Kingdom rose much less in 1958 than did the rate of deposition, perhaps because heavy rain washed $^{90}Sr$ from herbage into the soil. Once $^{90}Sr$ entered the soil it might still be absorbed through the roots of grass and other crops, but the amount at present taken up in this way was relatively small.

*$^{90}Sr$ in Human Bone*

Measurements on bone samples from the first few months of 1958 showed only a slight increase compared with corresponding results for 1957—results to be expected, since the level of $^{90}Sr$ in the diet in the relevant period had increased very little compared with the previous year.

Irradiation of human bone and bone-marrow attributable to $^{90}Sr$ was at present small in relation to that from the natural radioactivity to which they were exposed; the variation in natural radiation levels from place to place was far greater than the additional radiation likely to arise from tests already conducted.

*Other Radioactive Materials*

Cæsium 137 was not readily taken up from the soil by plants and, unlike $^{90}Sr$, was not retained in the body for long periods. Its biological significance arose from genetic effects. The dose to the gonads delivered by cæsium was small in relation to variations in natural radiation between different parts of this country.

The incorporation into the body of plutonium from fallout was small in importance compared with that of $^{90}Sr$, since plutonium was only very slightly absorbed from food. Both materials could be absorbed through inhalation, but this was a minor source of intake.

The concentration of carbon 14 was being kept under review because of its long persistence, notwithstanding the very low rate of irradiation that it caused in the human body.

## NEW WELLCOME LABORATORIES

FIFTY years ago Dr. Dale, who had joined the Wellcome Laboratories in 1904, addressed a memorandum to Mr. Henry Wellcome saying that the potential importance of immunology was such that it needed a separate laboratory. On May 1 Sir HENRY DALE, as chairman of the Wellcome Trust, inaugurated new laboratories at Beckenham which are to cost some £2 million. The Beckenham establishment is the main research unit of the Wellcome Foundation Limited, but this company also has laboratories of tropical medicine in London, a veterinary research station at Frant in Sussex, and research laboratories at Tuckahoe (New York) and Kabete (Kenya). It carries on business throughout the world as Burroughs Wellcome & Co., and all its distributed profits go to the Wellcome trustees, whose latest report is reviewed on page 978.

Sir Henry described the new buildings as descendants of those which Henry Wellcome originally set up as two separate units—the physiological research laboratories in 1894 and the chemical research laboratories in 1896. Recalling his ten years at the laboratories, and his later associations as an Old Wellcomian, he paid a special tribute to his friend, Mr. A. T. Glenny, who joined the laboratories in 1899 and whose record of service to them "altogether outclasses any which I could claim for myself." Others of whom he spoke particularly were George Barger (1903–09), A. J. Ewins (1899–1914), Prof. J. H. Burn (1914), Patrick Laidlaw (1909–13), and Dr. R. A. O'Brien (1910–40). But, he added, "I cannot even begin to choose names for individual mention, from the still growing record of the distinguished scientists who have worked here since my own departure in 1914, under Dr. O'Brien, under his successor Dr. Trevan, and now under Colonel Mulligan, who is at present in charge of all this biological division of the Wellcome Research Laboratories." Of the four new buildings, three were to be used for research on the viruses responsible for several human and animal diseases and for the production of specific antigens, vaccines, and agents of artificial immunity, while the fourth was devoted to the further development of immunising agents against anaerobic bacteria and their toxins. In one of the buildings, which came into use in 1957, poliomyelitis vaccine was being prepared.

Dr. D. W. ADAMSON, research director of the Wellcome Foundation, who presided, explained that the laboratories are both for research and for production. Speaking of the ever-present risk that "production will elbow out the research which gave it life," he said that the solution was to have them in separate homes closely connected. The sixth of the major buildings at Beckenham was to be for pharmacology.

Mr. M. W. PERRIN, chairman of the Wellcome Foundation, said that the company is spending about £1¼ million a year on research and development.

# Dialogues of Today

## COLLEGES GALORE!

ERYXIMACHUS: I have brought my colleague Pathologus with me today, Socrates, for he wants to consult you about the constitution of his college.

SOCRATES: What college is that, Pathologus?

PATHOLOGUS: It is the college which the pathologists propose to set up, Socrates.

SOCRATES: And with what object?

PATHOLOGUS: To promote the interests of pathologists.

SOCRATES: And I suppose that pathology is one of those.

PATHOLOGUS: Naturally.

SOCRATES: And are there others?

PATHOLOGUS: Well, Socrates, the days have gone by when specialists could afford to be interested solely in the academic aspects of their work. They must think about their status in the Health Service, and, naturally, of the remuneration which depends upon it. The existing colleges have not neglected the welfare of physicians and surgeons and obstetricians in these respects, but they have shown little interest in pathologists, upon whose help they themselves depend.

ANALYTICUS: I think that is true of psychiatrists also, Socrates; for though a few distinguished psychiatrists may get into one of the older colleges, the rank and file have no reason to owe it any loyalty, and this important branch of medicine fails to attract as many good men as it should, and cannot get from the State the money it needs. Consequently many psychiatrists, like the pathologists, want a college of their own, and are convinced that until they get one they will not receive the recognition they deserve.

SOCRATES: I am a little puzzled by what both of you say; for are there not already associations of pathologists and psychiatrists to look after the interests of such specialists?

PATHOLOGUS: Yes there are.

SOCRATES: And if they were turned into colleges, would they consist of any different people from those who now form the associations?

PATHOLOGUS: No.

SOCRATES: But you tell me that these associations are inadequate to raise the status of their members. Why should the same people become able to do so merely because they call themselves a college?

PATHOLOGUS: I can see that you are unfamiliar with human nature, Socrates, and are unaware that membership of a college by examination confers a status which is higher than membership of an association, and would be recognised as such by those who make appointments and decide on remuneration.

SOCRATES: The membership of your college, then, Pathologus, would be hard to obtain?

PATHOLOGUS: Yes, we should hope to make it a mark of distinction.

SOCRATES: Then how would that help your rank and file, most of whom I suppose would not obtain it? Is there not a real dilemma that membership of a college which is open to everyone would be of little value, while one which is difficult to obtain would satisfy only the few?

PATHOLOGUS: We might get over that by having a fellowship which is hard to obtain and a membership for those who now hold diplomas of universities or other colleges.

ERYXIMACHUS: I think that those who make the appointments would soon penetrate that disguise, Socrates. For my part I am opposed to these ideas, for surely the value of the higher qualifications which colleges confer comes from their rarity. To multiply both colleges and qualifications would be to cheapen them. As one might say, when everyone is somebody, then no-one's anybody.

SOCRATES: Tell me then, Eryximachus, whether you agree that your own college neglects the pathologists and whether it could do more to meet their needs?

ERYXIMACHUS: I don't agree, Socrates, that it neglects them, for many distinguished pathologists are fellows of our college, and it has a committee concerned solely with pathology. If we took in all the rank and file we should change the character of our college and break with its long and great traditions.

SOCRATES: Apollodorus, you are a scholar. Tell us how colleges have been founded in the past and with what object.

APOLLODORUS: To promote learning, Socrates, and to bring together scholars, and particularly scholars of different kinds, so that the biologist and the priest and the historian may eat at the same table, and educate themselves by learning the ideas of others and the limitations of their own. And that seems to me to be the weakness of colleges of pathologists and psychiatrists and other specialists, for they will not include men whose work and minds are different from their own, and they will tend to emphasise the exclusiveness of specialists rather than broaden their outlook. I think also that those who think that prestige comes from a college have not thought sufficiently deeply; for prestige comes from wisdom, and not merely from technical excellence, and is itself the source of the power to look after the interests of members of the college.

ERYXIMACHUS: What Apollodorus says, Socrates, is true of the older colleges, for they have steadily enlarged the range of their membership, so as to include many experts with whose work they were not originally concerned, and therein lies part of their strength.

ENTHUSIASTICUS: Can't we carry that a step further, Socrates? Surely pathology and psychiatry are parts of medicine. The psychiatrist is a physician, and the pathologist is largely one. This is not merely because pathology is invading clinical medicine, but also because clinical medicine is invading pathology. For example, in that vast and growing field of medicine in which disorders of function are measured by biochemical changes the distinction between the bedside and the laboratory is geographical and technical, but does not demarcate specialties at all. Institutions are the forms of learning, and if they do not grow with the life of thought they will be cast off like old skins, however great their traditions and scholarship. In my view all this multiplication of colleges is madness: it is literally schizophrenic—a splitting of the mind of medicine. To change the metaphor, the branches can no more do without the main stem than the stem without the branches. It's time the old trees discovered they have grown some new boughs, and grew some new roots to nourish them.

# Medicine and the Law

## Terms of Employment

DURING the war various methods of industrial conciliation were built up with a view to avoiding strikes which would have damaged the war effort. Much of the system then established was continued after the war and has contributed to industrial harmony.

An important part of this system has been the Industrial Disputes Order, made under emergency war-time powers and since continued in force by temporary legislation. The Government evidently feel that the time has now come to put matters on a permanent footing. The Industrial Disputes Order as such was revoked earlier this year, and legislation is now before Parliament [1] to replace it by permanent provisions which will be rather wider in scope than those of the Order.

The new provisions will operate where terms and conditions of employment, either generally or in any district, have been fixed by agreement or award and the parties to the agreement (or the proceedings in which the award was made) are organisations representing a substantial proportion of the employers and workers concerned. The phrase "organisations of employers and workers" is wider than the phrase "trade union" used in the old Industrial Disputes Order, and apparently embraces organisations representing professional men.

1. Terms and Conditions of Employment Bill.

If it appears that, as regards any worker, an employer is not observing the terms and conditions of employment laid down in the agreement or award, the matter may be reported to the Minister of Labour. The Minister must then take steps to settle the dispute. It seems that he may adopt various methods, but if all else fails he must refer the matter to the Industrial Court established by Act of Parliament in 1919.

If the Bill becomes law, it will presumably apply to doctors in the employment of hospital boards and local authorities, in so far as recognised conditions of employment are fixed by negotiation. If an authority fails to comply with these conditions, the matter could be reported to the Minister. The new machinery will not, however, be available for the settlement of questions arising out of the terms of service for medical practitioners laid down in the National Health Service (General Medical and Pharmaceutical Service) Regulations, 1954.

# Public Health

## Prevention of Tuberculosis

THE Minister of Health [1] has informed local health auhorities that he is prepared to approve extension of B.C.G. vaccination to children aged 14 and upwards and to students; and he has set out his views on tuberculosis registers.

*B.C.G. Vaccination*

Since 1949 B.C.G. vaccination has been offered to all nurses and medical staff in hospitals and (at the discretion of chest physicians) to the close home contacts of tuberculosis cases. Since 1953 vaccination has been offered to children before they left school and between their 13th and 14th birthdays. The new extension applies to:

1. Children aged 14 years and upwards who are still at school and also students attending universities, teacher training colleges, technical colleges, or other establishments of further education.
2. Children under 13 years of age, when these number a few among a whole school class that is to be offered vaccination.

*Tuberculosis Registers*

The Minister points out that, while chest clinics keep a record of all cases of tuberculosis attending the clinic, the clinic's catchment area is often less well defined than the area of the local health authority; and it is important that the medical officer of health should maintain a register; in counties it may be more convenient for registers to be kept on a divisional or area basis. By means of such a register the M.O.H. could study the pattern of incidence and detect significant groupings.

## Increased Incidence of Gonorrhœa

The incidence of gonorrhœa is increasing, notably in women. In England and Wales, whereas in 1951 14,975 cases in men and 3089 in women were dealt with at clinics for the first time, in 1957 the figures were 19,615 and 4737 respectively; and thus in women there was an increase of over 50% in six years. The increase continued in 1958.

The Ministry of Health,[2] expressing concern at this trend, says that a relatively small group of promiscuous infected women constitutes a most important factor in spreading the disease, and it is the apparent enlargement of this infected group that is the principal cause for concern. The Ministry [2] has asked local health authorities to review, in consultation with the hospital authorities, its arrangements for contact tracing, and to make any possible improvements. The Ministry is seeking the cooperation of hospital authorities [3] and of executive councils.[4]

1. Circular 7/59.
2. Circular 6/59.
3. H.M.(59)42.
4. E.C.L. 23/59.

## Œstrogens in Livestock Fattening

The Agricultural Research Council is inquiring into the possible dangers associated with the administration of synthetic œstrogens for the fattening of livestock, including poultry.

For this purpose stilbœstrol or hexœstrol are implanted or included in feeding-stuffs. In a statement issued to the Press, the Ministry of Agriculture, Fisheries, and Food says that there is no apparent risk of damage to the animals when the drugs are administered to beasts intended for slaughter, in the dosages recommended by the manufacturers. When animals change hands, however, they may be treated more than once, and overdosing might lead to some undesirable side-effects and possibly render the meat less attractive, although not dangerous to the consumer. But since œstrogens will in certain circumstances cause sterility, the administration of these substances to animals not intended for slaughter is to be avoided. Above all, farmers should ensure in their own interests, not only that breeding stock are not implanted with stilbœstrol or hexœstrol, but also that in no circumstances are feeding-stuffs containing these hormones fed to them.

These substances, says the statement, can have a serious toxic effect on man when small amounts are swallowed or even inhaled, and it draws attention to the dangers of home mixing of these materials with other feeding-stuffs on the farm. Great care should be taken with all œstrogen-containing substances, which should be kept in a safe place and, in particular, well away from children.

The A.R.C.'s inquiry includes investigations into the behaviour of synthetic œstrogens excreted by animals. The results of experiments so far obtained indicate that the risk of contamination of pastures and soil by accumulation is not serious, but until the results have been confirmed the Council cannot positively assert that there is no risk. A further statement will be made as soon as possible.

## Ice-cream

Regulations which came into force on April 27 [1] consolidate and amend the Ice-Cream (Heat Treatment, &c.) Regulations, 1947–52. The new regulations require that ingredients used in the manufacture of ice-cream shall be pasteurised by one or another of three specified methods or sterilised, and thereafter kept at a low temperature until the freezing process is begun. The regulations make it an offence to sell or offer for sale ice-cream which has not been so treated or which has been allowed to reach a temperature exceeding 28°F without again being treated. They exempt from the requirement as to pasteurisation or sterilisation certain types of water ices and ice lollies which are sufficiently acid to make such treatment unnecessary.

1. S.I. 1959, no. 734. Ice-Cream (Heat Treatment, &c.) Regulations, 1959. H.M. Stationery Office. 3*d*.

## Infectious Diseases in England and Wales

| Disease | Week ended April | | | |
|---|---|---|---|---|
| | 4 | 11 | 18 | 25* |
| Diphtheria | 2 | 2 | 3 | 4 |
| Dysentery | 771 | 906 | 806 | 837 |
| Encephalitis: | | | | |
| Infective | 4 | 2 | 4 | 1 |
| Post-infectious | 7 | 5 | 2 | 3 |
| Food-poisoning | 117 | 366 | 160 | 283 |
| Measles, excluding rubella | 25,276 | 22,855 | 17,698 | 14,474 |
| Meningococcal infection | 28 | 20 | 29 | 23 |
| Ophthalmia neonatorum | 18 | 31 | 28 | 34 |
| Paratyphoid fever | 17 | 22 | 6 | 4 |
| Pneumonia, primary or influenzal | 761 | 692 | 510 | 340 |
| Poliomyelitis: | | | | |
| Paralytic | 6 | 14 | 12 | 10 |
| Non-paralytic | 3 | 5 | 3 | 11 |
| Puerperal pyrexia | 249 | 222 | 200 | 223 |
| Scarlet fever | 916 | 689 | 671 | 769 |
| Smallpox | .. | .. | .. | .. |
| Tuberculosis: | | | | |
| Respiratory | 589 | 685 | 661 | 562 |
| Meninges and C.N.S. | 4 | 9 | 11 | 4 |
| Other | 42 | 45 | 55 | 68 |
| Typhoid fever | .. | .. | .. | 5 |
| Whooping-cough | 608 | 634 | 623 | 710 |

* Not including late returns.

# In England Now

*A Running Commentary by Peripatetic Correspondents*

THIS has been charities week, and I am now recuperating. On Monday night we assembled with torches at the castle and marched to the Calton Hill, led by a pipe band, in a spectacular procession, half a mile long, stretching right across the streets. On Wednesday we had the Border raids. About twenty busloads set off for Melrose, each by a different route. We were supposed to be in fancy dress, so I wore a tartan rug, an Eastern-type veil, and my border-raid-style hat, all held together by my old prep school scarf. We were given collecting-tins on the bus, and stopped at all significant towns on the way, where we visited all the houses, held up the people in the street, and blocked the traffic by sitting in the middle of the road. Some drivers were not overpleased about this, but most of the people of whom we demanded money were quite tolerant. We raised over £800.

Thursday was house-to-house collection in Edinburgh. This also was done from buses. Each bus was given a district to cover, and dropped off pairs of collectors, picking them up an hour later. I had a housing estate, consisting of prefabs and tenements, which were not very productive. Most of the occupants were old-age pensioners, who made depressing remarks before shutting the door. "I canna support mesel'" was a favourite.

Friday we spent getting ready for the procession on Saturday. Our dragon was sensational. It was about 80 ft. long, painted red with spots, and had an enormous head 10 ft. high, containing harness for the three people carrying it.

While we were away on the Border raids students from another university had taken, among other things, a carved wooden lion from the hall of our residence. It was a kind of mascot. We were all rather annoyed; so on Friday evening some of us chartered a bus and set off to try and get it back, or some similar article in exchange. We had been instructed to bring back some girls for the Slave Market next morning, where they were to be auctioned to the public. Accordingly we removed some and put them and a shield into the bus, whereupon the driver, who was terrified, drove off at high speed. Our captives raised a large sum in the slave market and in the procession on Saturday they were transported through Edinburgh in a cage.

At the start of the procession it was raining heavily. In fact, we in the dragon were the only people who kept dry, though in bare legs it was very cold. But children screamed as we approached them, and we were showered, or pelted, with money, which is the custom. In the end we had to abandon the dragon in the rain. It had almost dissolved and when I got in my head came through its back.

The police apprehended two people hauling a piano on to the National Monument, and that was the end of Charities Week.

* * *

In our consultant pathologist I think I have a potential contributor to the *Journal of Speculative Natural Philosophy* (April 18, p. 830). We had been talking about iatrogenic bleeding in patients with coronary thrombosis. He said he was interested to hear that "iatrogenic" meant "created by a doctor", as he'd always wondered what it meant. Brushing aside its clinical implications with the remark that he didn't think the risk of bleeding was all that great, and you might get an "iatrogenic coronary" if you didn't use anticoagulants, he settled down to the etymological side of the problem. He asked for another word ending in "genic". I offered him "carcinogenic"—perhaps a mistake for he at once pointed out that carcinogenic means "creating cancer", then "iatrogenic coronary" means "a coronary that creates doctors", and went on to ask whether this meant that the children of patients with coronaries tended to take up medicine.

* * *

Advertisements for 39 consultant anæsthetist posts last week aroused considerable interest and comment, particularly as 39 obituaries have appeared this week. It suggested that some underhand business was afoot, so we sent Our Man to investigate.

He reports that all the vacant posts now advertised are in the South of England and—by a strange coincidence—all the late esteemed gentlemen had attended the first South England Anæsthetics Congress held at Popplethwaite Hospital barely two weeks ago.

On the morning of that fateful day they, together with some 60 others, had been entertained to lectures and demonstrations by the senior and junior staff of the hospital. At lunchtime they adjourned to the board-room for food and refreshment. Our Man learned that it had been a sumptuous affair. Sherry, sweet and dry, flowed as freely as the sap in the vine that had produced the grape. The immense board-room table groaned with the weight of the hospital silver plate, bearing a rare choice of victuals.

All went well until the Camembert. Then, suddenly, the most venerable anæsthetist was seen to place outstretched palm of hand to epigastrium. Before the nearest colleague could stretch forth a hand to help, he had fallen without so much as a lamb's whimper prone on the carpet. He had dropped with great speed to stage three, plane two, and was, alas, at stage four before hand could be put to pulse. Barely a second later another gentleman was taken likewise. And another. Among the noble gathering there was no syringe, ampoule, laryngoscope, tube, oxygen, nor Boyle's machine to hand. As the members of Popplethwaite Hospital looked on aghast their anæsthetic colleagues dropped like flies around them.

Within the hour there were 63 admissions to the medical wards and—regrettably—12 direct to the mortuary. Within a day or so the death count had risen to 39 with some 20 detained.

Our Man questioned many people. Was it the sherry? The oysters? The caviar? Nobody seemed to know. Significantly, not one of the staff, either junior or senior, of Popplethwaite Hospital was so much as taken ill. Which was a great discomfiture to them, seeing that they were the hosts.

Not since the days of the Borgias has such a bold attempt been made to create dead men's shoes. The direct outcome of the episode is that there are now more anæsthetic jobs advertised than can be filled; also that the South England Surgery Congress held three days ago was attended by only 2 members.

* * *

THE *Senti*MENTAL *Ped*ANT,
or *The Centiperipatide*

Sometimes, when in mystic mood I dare to contemplate
The fortunes and vicissitudes of freakish fate,
I think about the problem of the simple centipede
And all the little tiny feet it doesn't really need.
How has it survived so long, this gentle modest creature,
This centipedalian sentence in a lumbricating metre?

Take Antidisestablishment—um—*ar*ianism;
A word without a glimmering of euphony or rhythm,
With not the slightest prospect of imparting information,
Which conjures up no vision to a man's imagination—
But which, a century or more since it saw day,
Tenaciously lives on, in some mysterious way.

Para-para-diaminodiphenyl-methane
(Another word, but one whose meaning's plain)
Will not, by contrast, quite achieve the accolade;
For Anti gives us pleasure, while by Para we're dismayed.
It strikes me that longevity, that coveted commodity,
Depends, for bugs and words alike, upon a spice of oddity.

But now a thought occurs which I can scarce explain,
So deep's the anguish of it and so profound the pain.
The piquancy which saves a word lies only in Man's mind;
So, turning to the centipede, what answer do we find?
It grieves me much to say it, but—how oft I must have trod
Upon this living witness to the comic sense of God.

# Letters to the Editor

## RESPIRATORY DISEASE IN THE PAST WINTER

SIR,—The experience of the Central Middlesex Hospital during the past winter, mentioned in your report of April 25 (p. 894), is echoed by our experience.

At this chest hospital of just over 100 beds, which accepts cases from a population of 375,000 in North-East Derbyshire, there were times in February and March when we had to refuse admission of acute chest and heart conditions among males. This is the first time we have had to refuse immediate admission since the old days of waiting-lists for tuberculous patients.

Our admissions and deaths were as follows:

| | *Total admissions* | *Deaths* |
|---|---|---|
| Jan. 1–March 31, 1958 .. .. .. | 260 | 23 |
| Jan. 1–March 31, 1959 .. .. .. | 307 | 45 |

We confirm Dr. Joules' statement that the past winter was the worst for chest diseases, not only in numbers, but also in the severity of the infections and complications, mainly in patients already suffering from chronic chest disease. In spite of a whole host of efficient antibiotics and other drugs, it certainly does not seem that we are winning the race against non-tuberculous lung diseases, and in view of the evidence against air pollution and smoking it seems that the deadly impact of pollution and smoking on the lungs is increasing at a faster rate than our discovery of means to cope with the damage caused.

Yet factories and houses are still being built without sufficient safeguards to prevent air pollution, and of course advertisers are quite unrestrained in dangling the " delights " of smoking before the eyes of the public. Although our densely populated and highly industrialised country is probably the worst affected, extension of industrialisation in other countries is causing world-wide concern over air pollution, and the March number of the journal of UNESCO is almost entirely devoted to articles from several countries on air-pollution problems.

Only factory and social legislation, and education on a national or even international scale, can make any big reduction in the mass of chronic chest disease, including carcinoma, and the medical profession should be in the forefront of the demand for the necessary measures.

T. A. BLYTON
Physician-Superintendent
J. S. CROWTHER
Chest Physician.

Walton Hospital,
Chesterfield.

## BLANKETS AND INFECTION

SIR,—For years blankets in hospitals have caused concern as a possible source of cross-infection, mainly because of the difficulty of laundering them and the obvious fluff they produce. To suppress the fluff, van den Ende and Thomas [1] suggested an oiling technique and Courtney Hardwood et al.[2] introduced methods of large-scale treatment of blankets and cotton fabrics. These methods, while very successful in reducing dust, have various practical difficulties.

More recently, Pressley [3] showed that the vast proportion of airborne ward dust is cellulose fibre, derived from bed linen and clothing. Because the dust from bed linen is less conspicuous, unless exposed to the proverbial beam of light after bedmaking, and because linen is readily sterilised by laundering, it tends to be ignored as a source of infective particles.

For studying the bacteria resident on materials, these simple methods are available:

(*a*) The sweep-plate method,[4] which tends to dislodge large loose particles on the surface.

(*b*) The dropping-weight method,[5] which gives a fair idea of the contaminated particles which will be disseminated by mechanical agitation of the fabric.

(*c*) The contact-plate method (Rubbo, personal communication), which assesses the degree of contamination by direct contact with the fabric.

In assessing the risk from blankets, method (*b*) was used. The counts by this method vary considerably from one site to another on the same article, generally being highest where the patient's skin has direct contact. At the moment in this hospital woollen blankets are laundered at infrequent intervals, whereas bed linen is changed frequently and is normally sterile after laundering.

The counts from various articles of bedclothes after several days' occupation of the bed were as follows:

| *Article* | *Number counted* | *Mean of counts* |
|---|---|---|
| Counterpane | 4 | 45 |
| Top sheet | 4 | 90 |
| Pillow slip | 4 | 173 |
| Blanket | 12 | 402 |

On the other hand, by the contact-plate method (Rubbo and Dixson, unpublished), bed linen invariably yields far higher counts than the woollen blankets.

Pressley [6] has now shown that all wool blankets can be sterilised by boiling without deterioration, and this method is now being tried in a ward of the Royal Melbourne Hospital.

The rise in bacteriological counts on boiled woollen blankets after a few days was as follows:

| *Type of blanket* | *Number counted* | *Mean of counts* | *Type of organism* |
|---|---|---|---|
| Blanket from laundry machine | 12 | 3·5 | Nearly all bacillus. |
| Blanket from ward before use | 12 | 6 | A few staphylococcal species. |
| Top blanket 1 day of use | 12 | 45 | Mainly " " |
| " " 2 days' use | 12 | 112 | " " " |
| " " 3 " " | 11 | 209 | " " " |
| " " 5 " " | 10 | 215 | " " " |
| " " 9 " " | 11 | 421 | " " " |
| " " 11 " " | 4 | 420 | " " " |

It seems that those experimenters who have concentrated solely on the blanket as the answer to dust-borne infection [7 8] have not considered the whole picture. Meanwhile, blanket boiling seems a safe way of giving the patient a bacteriologically clean blanket if Pressley's simple requirements [6] are adhered to.

Clinical Pathology Department,
Royal Melbourne Hospital,
Melbourne, Victoria.

D. C. COWLING.

SIR,—The experiments of Dr. Anderson and Mr. Sheppard (March 7) are of great interest and it is to be hoped that their observations will be extended to blankets of identical weave and general construction but made from textile fibres other than wool. One would expect the same general pattern of results to be obtained from all blankets of the same construction with only minor differences associated with the properties of the individual textile fibres.

Anderson and Sheppard state that pathogenic staphylococci have always been isolated from woollen blankets when they have investigated hospital outbreaks of staphylococcal infection. This observation, however, means very little in relation to the use of wool unless the corresponding observations are also given for other fabrics in the ward, such as pillowcases, sheets, counterpanes, and drapes.

The implication in their paper that wool cannot be sterilised is not correct. Woollen blankets can be brought to a standard of sterility at least as high as that of normal, cotton ward-blankets by gaseous sterilisation with ethylene oxide or propylene oxide, or as a normal laundry procedure by boiling at a pH value not greater than 7. Details of this method were

1. van den Ende, M., Thomas, J. C. *Lancet*, 1941, ii, 755.
2. Courtney Harwood, F., Powney, J., Edwards, C. W. *Brit. med. J.* 1944, i, 615.
3. Pressley, T. A. *Lancet*, 1958, ii, 712.
4. Blowers, R., Wallace, A. T. *ibid.* 1955, i, 1250.
5. Puck, T. T., Robertson, O. H., Wise, H., Loosli, C. G., Lemon, H. M. *Amer. J. Hyg.* 1946, **43**, 91.
6. Pressley, T. A. C.S.I.R.O. Progress Report (to be published).
7. Schwabacher, H., Salsbury, A. J., Fincham, W. J. *Lancet*, 1958, ii, 709.
8. Anderson, K. F., Sheppard, R. A. W. *ibid.* March 7, 1959, p. 514.

first given by Cunningham [1] and it is hoped to publish shortly the results of an extension of this work based on experiments carried out in this Division and at the Royal Melbourne Hospital.

Although the observations of the dissemination of staphylococci when blankets are shaken are relevant to the question of cross-infection, the work of Anderson and Sheppard does not of itself establish reasons for choosing any particular textile fibre for hospital blankets.

Commonwealth Scientific and Industrial Research Organisation,
Division of Protein Chemistry,
Melbourne, Victoria. T. A. PRESSLEY.

## VITAMIN $B_{12}$ AND DIABETIC RETINOPATHY

SIR,—In their paper of April 25 on vitamin $B_{12}$ and the course of diabetic retinopathy, Dr. Keen and Mr. Redmond Smith imply that the improvement often seen in diabetic retinopathy treated by hypophysectomy may be due to postoperative fall in blood-pressure. It is, however, untrue to say that pituitary ablation leads to a fall in blood-pressure.[2] Unlike adrenalectomy, hypophysectomy is of no value in the treatment of severe hypertension, and a blood-pressure of 210/110 mm. Hg may be maintained in the absence of anterior pituitary function. Furthermore, short-term deprivation of cortisone does not lead to a rapid fall in blood-pressure, as in the adrenalectomised patient, because aldosterone secretion is maintained by the otherwise dormant adrenal cortex. [3]

The pathogenesis of diabetic retinopathy is obscure but arterial hypertension seems to play no definite part. Palliation of severe acute retinopathy by means of hypophysectomy is presumably due to the removal of pituitary trophic hormones or as yet unidentified target-organ hormones, since there is no significant reduction in blood-pressure.

Derbyshire Royal Infirmary,
Derby. K. J. GURLING.

## PERSONALITY DISORDER AND DULLNESS

SIR,—May we comment on part of the summary following Dr. Craft's otherwise valuable article of April 25? He says that "the findings throw doubt on excessive dependence on intelligence tests for the diagnosis of mental defect" and adds the obvious caveat that test results must be related to social history and clinical findings. Clearly, however, excessive dependence on anything is by definition dubious.

It seems that, although Dr. Craft's highly selected sample was mentally defective in the legal sense, clinically his experimental group could, as he implies, be regarded as psychopathic. The fact that many had I.Q. increments does not, in our submission, indicate that they were never as subnormal as first testing indicated but rather that intelligence, like other aspects of mind, is not an entirely inflexible attribute. From his writings we think that Dr. Craft subscribes to this view and not to the fiction that a subnormal person showing improvement in intellectual level proves thereby that he never was subnormal. Moreover, there is substantial evidence that Dr. Craft's test results reflected accurately the intellectual status of his patients on initial examination, and latterly the changed level of his psychopathic group and the unchanged status of his controls. Thus there appear to be two forms of "arrested or incomplete development of mind" among high-grade defectives, on the one hand permanent and on the other impermanent to varying degrees. It is therefore important not to confuse diagnosis with prognosis; the test itself will not necessarily reveal the latter in this population; but an adequate social history, taken in conjunction with it, often will. But because the test *alone* may fail to carry with it an accurate prognosis, this does not limit its use in diagnosis.

While Dr. Craft's finding that a greater number of his sample of patients with personality disorder had been exposed to early adverse influences is important, it is worth noting that the majority of subcultural defectives with similar backgrounds do not later show personality disorder as Dr. Craft has described it. On the contrary, the outcome for such persons is relatively good in adult life and recovery from the effects of early deprivation tends to occur to varying extents; indeed, within the feeble-minded hospital population, those with the worst social history usually have the highest potentials and the best prognosis.

The Manor Hospital,
Epsom, Surrey. ANN M. CLARKE
A. D. B. CLARKE.

## POLYCYTHÆMIA

SIR,—We have read with great interest your leading article. We feel, however, that you have been too dogmatic in asserting that the use of $^{32}P$ has led to an increase in the incidence of acute leukæmia, and in recommending that $^{32}P$ should not be used for treating patients with a life expectation of over seven years. Published reports on series of patients with polycythæmia vera treated with $^{32}P$ show that opinions are divided as to whether it increases the incidence of leukæmia. Although Pike [1] concluded that there was an increased incidence of acute leukæmia, others [2 3] have not considered this to be so. The main difficulty in attempting to assess the leukæmogenic effect of $^{32}P$ in polycythæmia is lack of information on the incidence of leukæmia in non-irradiated patients.

At Hammersmith Hospital 101 patients have been treated with $^{32}P$ between 1949 and 1958 (table I). 2 patients have so far developed leukæmia; this was of the acute type in 1 and chronic myeloid leukæmia in the other. In 3 myelosclerosis developed. Both patients who developed leukæmia had been treated previously by external irradiation, but none of the patients with myelosclerosis had received any external irradiation. The data on the patients are given in table II.

TABLE I—NEW PATIENTS TREATED WITH $^{32}P$

| 1949 | 1950 | 1951 | 1952 | 1953 | 1954 | 1955 | 1956 | 1957 | 1958 |
|---|---|---|---|---|---|---|---|---|---|
| 2 | 8 | 9 | 9 | 12 | 12 | 15 | 11 | 11 | 12 |

TABLE II—PATIENTS IN WHOM LEUKÆMIA OR MYELOSCLEROSIS DEVELOPED AFTER TREATMENT WITH $^{32}P$

| Case no. | Date of initial treatment with $^{32}P$ | No. of injections and total dose | | Complication | Date of diagnosis of complication |
|---|---|---|---|---|---|
| 1 | Oct., 1952 | 2 injections | 15 mC | Acute leukæmia | Dec., 1954 |
| 2 | Nov., 1950 | 8 ,, | 57 mC | Chronic myeloid leukæmia | May, 1955 |
| 3 | July, 1949 | 2 ,, | 12 mC | Myelosclerosis | Oct., 1952 |
| 4 | May, 1952 | 1 ,, | 4·5 mC | ,, | Jan., 1958 |
| 5 | May, 1954 | 3 ,, | 13 mC * | ,, | 1958 |

* The patient received 13 mC in 2 injections at Hammersmith Hospital. She was subsequently treated in the U.S.A., and the actual amount given is not known.

As polycythæmia vera, myeloid leukæmia, and myelosclerosis are generally considered to belong to the myeloproliferative group of diseases, they can be expected to coexist or to merge into each other. In view of this natural association it is inevitable that any treatment which increases the life-span of patients with polycythæmia vera will indirectly increase the incidence of leukæmia and myelosclerosis irrespective of any leukæmogenic action. In order to find out whether $^{32}P$ was

1. Cunningham, A. F. *New Zealand Hospital*, 1956, **9**, 36. Reprinted in England by Wool Textile Delegation, Bradford.
2. Baron, D. N., Gurling, K. J., Radley-Smith, E. J. *Brit. J. Surg.* 1958, **45**, 593.
3. Thorn, G. W., Ross, E. J., Crabbé, J., Van 't Hoff, W. *Brit. med. J.*, 1957, ii, 955.

1. Pike, G. M. *New Engl. J. Med.* 1958, **258**, 1250.
2. Lawrence, J. H. *J. Amer. med. Ass.* 1949, **141**, 13.
3. Wasserman, L. R. *Bull. N.Y. Acad. Med.* 1954, **30**, 343.

leukæmogenic it would be necessary to determine the incidence of leukæmia in polycythæmic patients treated by some method other than irradiation, but which prolonged life to the same extent as $^{32}P$.

Radiation is apparently not a potent leukæmogenic agent in the sense that only a small proportion of an irradiated population will develop leukæmia. It is unlikely, therefore, that an increased incidence of leukæmia could be detected by reviewing comparatively small series of patients treated with $^{32}P$. This information can only be obtained by collecting data from all workers who have had any experience of the treatment of polycythæmia with $^{32}P$. Only when this has been done will it be possible to assess the risk and to offset it against the morbidity and mortality of untreated or inadequately treated polycythæmia.

In view of the great advantages which $^{32}P$ has over other methods of treatment we see no reason at present to restrict this treatment to patients with a limited expectaton of life.

Department of Radiotherapy, L. SZUR
Department of Hæmatology, S. M. LEWIS
Medical Research Council Radiotherapeutic Research Unit, A. W. G. GOOLDEN.
Hammersmith Hospital, London, W.12.

## DEATH FROM TONSILLECTOMY

SIR,—On his own admission Mr. Fauset Welsh was, in 1934, in the habit of operating upon children he had never seen before, for no indications known to him and without ever seeing them again to discover if he had done them harm or good. On the average throughout the year, an incomplete and therefore badly performed operation was inflicted upon a child every second operating session. What sort of surgery is this?

But let us not be deflected from the true issue. If Mr. Welsh will look at the end of his letter as printed and then transfer his gaze to the bottom of the adjacent column he will see something not to his advantage. I invite him to read this paragraph and then answer in public the most important question in my article: "How many lives per annum can properly be expended in exchange for the supposed benefits of this operation?"

General Hospital, Swansea. M. E. N. SMITH.

## ANTIBIOTIC COMBINATIONS

SIR,—It is disturbing that a group of doctors should have fallen prey to pharmaceutical advertisement in such a wholesale manner as Dr. Birkett and his colleagues describe in their letter of April 18.

Novobiocin is unsuitable for routine use because of frequent sensitivity reactions and the rapid emergence of resistant staphylococci. Many resistant "hospital staphylococci", which are becoming increasingly prevalent in general practice, are equally resistant to tetracycline and penicillin. It can only be a short time before 'Albamycin-T' is added to the list of ineffective treatments in the infections due to this organism. In any case, if novobiocin is to be used in combination, a bactericidal drug would probably be better than tetracycline.

A fair comparison of the treatments used cannot be made on the whole group of infections cited. Whilst some of these will be predominately due to specific organisms, a mixed flora will be largely responsible for others. Accordingly, the exercise of a little clinical and pathological judgment should lead to the selection of the most suitable individual antibiotic in the majority of cases. I would be very surprised if treatment on these lines would be less effective than the blunderbuss therapy with albamycin-T, and certainly the disadvantages would be avoided.

Rhoose, Glamorgan. NORMAN SALES.

## CAUSE OF CLUBBING

SIR,—I read with great interest Dr. Hall's article of April 11. He suggests that the effect of hilar vagotomy in hypertrophic pulmonary osteoarthropathy may be due to the cessation of reflex dilatation of pulmonary arteriovenous anastomoses. I should like to propound, with some diffidence, another hypothesis, citing one general observation and one recent case in particular.

During the past two years, 18 cases of hypertrophic osteoarthropathy associated with pulmonary disease have been seen in this hospital (associated with bronchial carcinoma [13], bronchiectasis [3], pulmonary adenomatosis [1], and pleural fibroma [1]).

The degree of foot, ankle, and wrist swelling sometimes varied with time, and in this respect the case of pleural fibroma was remarkable.

A man of 64 developed within twelve hours on Dec. 6, 1956, severe stiffness and swellings of both feet, ankles, and wrists. These symptoms continued to fluctuate until June, 1957, when all swelling and stiffness of the joints had subsided.

From June, 1957, to July, 1958, he remained free from joint swelling and stiffness. About July 20, 1958, the joint symptoms recurred with remarkable suddenness; from then on, the degree of swelling and stiffness waxed and waned considerably. There were periods of up to three weeks without joint symptoms. On several occasions, when the joint swellings were developing he "never passed more than a cupful of urine for a day or two."

In February, 1959, a chest X-ray revealed a large round opacity in the lower right hemithorax. The case was referred to Mr. Gordon D. Jack, who made a tentative diagnosis of pleural fibroma. On Feb. 23 he was admitted to Baguley Hospital. Considerable pitting œdema of both feet, ankles, and lower legs was noted, and the wrists were swollen and stiff. Marked finger and toe clubbing was present. The right breast was enlarged, firm, tender, and pyriform; the left breast was normal. X-rays of leg and forearm bones showed new periosteal bone formation. By Feb. 28 all joint swellings and stiffness had subsided. The swelling and tenseness of the right breast had subsided considerably. The joint symptoms did not recur.

As the operating-theatre in Baguley Hospital was temporarily closed, the patient was transferred to Park Hospital, Davyhulme, where on March 19 Mr. Jack removed from the right lower hemithorax a pleural fibroma measuring 24 × 10 × 10 cm. and weighing 4 lb. 12 oz. (2250 g.). An uneventful recovery ensued. There has been no recurrence of joint symptoms, and the right breast swelling is about a third the size it was on admission.

The hypothesis is outlined thus:

There are distributed along the course of the pulmonary artery [1] nerve endings, some lying just deep to the intima in a fine network. It is suggested that these function as receptors in the volume-control mechanism. The presence of bronchial-artery/pulmonary-artery shunts [2] has been demonstrated in association with hypertrophic pulmonary osteoarthropathy. These shunts will allow the ejection of blood from the systemic circulation into a vessel with a lower pressure—thus acting as localised superchargers and thereby resulting in undue stimulation of the receptors in the pulmonary-artery wall near the shunts. The receptors are connected to the vagal nuclei in the medulla. Stimulation [3] of the proximal end of a cut vagus has been shown to produce an antidiuresis. This may be effected by stimulation of connections [4] between the vagal nuclei and the hypothalamus with increased A.D.H. production, or a chemical agent may be released directly from the medulla into the blood-stream acting directly on the renal tubules or indirectly via the adrenal cortex. Whatever the mechanism operating between the vagal nuclei and the renal tubules, the net result is an increase in body-water and extracellular sodium

1. Mitchell, G. A. G. Cardiovascular Innervation; p. 234. Edinburgh, 1956.
2. Cudkowicz, L., Armstrong, J. B. *Thorax*, 1953, **8**, 152.
3. Pickford, M. *in* Modern Views on the Secretion of Urine; p. 141. London, 1956.
4. Footnote 1, p. 53.

(Bayliss [5] discusses volume control and the evidence of vagal involvement).

The unusual distribution of this œdema may be partly accounted for by the combination of a normal or augmented heart action and a normal serum osmotic pressure.

Fluctuations in the degree of œdema may be due to changes in the blood-flow through the shunt, brought about by confinement to bed, changes in the position of large tumours relative to the rest of the lung, or growth of tumours ablating the shunts themselves.

In summary, it is suggested that hypertrophic pulmonary osteoarthropathy is an œdema, unusual in distribution and sequelæ, resulting from the excessive stimulation of volume receptors by the supercharge mechanism described, the vagus nerve being an integral part of the volume-control mechanism. The link between the vagal nuclei and the renal tubules is at present unknown.

Baguley Hospital,
Manchester, 23. LESLIE DOYLE.

## PHENYLBUTAZONE AND PROLAPSED INTERVERTEBRAL DISC

SIR,—Like Dr. Gillhespy (March 7) I often ask myself why so many patients with sciatic pain are not given the benefit of this valuable drug. It is not a general analgesic or anti-inflammatory drug and it is useless against the pain of injuries, neurological diseases, or bacterial inflammation. Yet it acts as a specific against rheumatic or thrombotic inflammation, and many chronic skeletal pains.

During the past seven years I have given phenylbutazone to 90 patients with pain of sciatic distribution. In half of them the result was dramatic; it was striking to witness the rapid disappearance of a pain which had been crippling the patient for weeks or months. In the remainder it had no effect. It is possible to classify patients exhibiting pain of this nature into two classes: (i) probably rheumatic in origin (responsive to phenylbutazone); (ii) probably neurogenic (unresponsive to phenylbutazone).

East Melbourne,
Victoria. MICHAEL KELLY.

## DISPOSABLE RECIPIENT SETS FOR BLOOD-TRANSFUSION

SIR,—Dr. Galley's letter of April 25 prompts us to comment on the new Capon-Heaton "giving" set used by us on many occasions during the past two months.

The plastic clamp is not entirely satisfactory as was noted by Dr. Jenkins and his colleagues (Jan. 17). In principle it is a good design but I feel it would be more efficient if made about $1^1/_2$–2 times as large.

Some of the eleven printed instructions on the box do not appear to produce the desired results. The instruction relating to tightening of the metal cap of transfusion bottles is such a vital instruction that it would be advisable to have it printed in bold print. A loose cap results in the rubber closure being pushed into the bottle.

Instruction (4) relates to the air-inlet filter sheath. If this is removed completely at this stage there is no control of the speed with which the filter chamber and drip chamber fill; the result is an overfilled drip chamber. We think the instruction should read "*loosen* sheath on air filter".

Instruction (5) would be better worded "squeeze and release filter chamber *gently* until *almost* full". This gentle approach prevents overfilling of the drip chamber. Filling of the filter chamber completely is almost impossible and manœuvres to achieve this usually end in filling the drip chamber.

Instruction (7) would be more helpful if it read "Remove sheath on air inlet filter, open clamp and expel all air from tubing and needle—close clamp". The present instruction does not indicate from where the air is to be expelled.

It may be some time before the instructions can be altered on the boxes and this letter may be of value to those using the outfits at present.

Department of Clinical Pathology,
Manchester Royal Infirmary. H. LEMPERT
M. LONGSON.

## PSYCHIATRIC SEMINARS FOR GENERAL PRACTITIONERS

SIR,—I was interested in Dr. Nichols' remarks about the Tavistock Clinic seminars for general practitioners (April 18). But it is fortunately not true that, because of the British Postgraduate Medical Federation's decision, the privilege of attending these courses is denied to practitioners from the provinces. Some of them travel to London once a week, and are finding their travelling and locum expenses themselves. The experience gained is worth far more than any financial help.

When I applied unsuccessfully to the Federation for a grant to cover some of my expenses, I was told that the University of London does not recognise the Tavistock Clinic for the purpose of courses for general practitioners, and that "the matter has already been considered by the relevant committee". So far no reason has been given for this lack of recognition. It is clear that many feel the need for something more positive than this official silence.

Nottingham. BRENDAN JACOBS.

## DISSEMINATED LUPUS ERYTHEMATOSUS OF THE ALIMENTARY TRACT

SIR,—We were extremely interested to read the account of this condition by Professor Bruce and Dr. Sircus (April 18) because we have under our care at present a woman aged 58 who, though presenting in a somewhat different way, has, we believe, similar lesions in her alimentary tract.

The patient presented with severe anæmia (Hb 4·6 g. per 100 ml., white cells 3400, polymorphs 2700 per c.mm.). The marrow was megaloblastic. A conventional histamine test-meal (0·5 mg. histamine subcutaneously) showed the absence of free acid, and vitamin $B_{12}$ was therefore given in large doses. Eleven days later there had been no response and accordingly parenteral folic acid was given and was immediately effective.

Despite the response to treatment the patient became extremely ill with fever, leucocytosis, vomiting and diarrhœa, and congestive heart-failure, for which no obvious infective cause could be found. These symptoms were managed conservatively and eventually subsided.

X-ray of chest: bilateral pulmonary œdema and small pleural effusion on two occasions during the acute illness.

Barium meal and follow-through: appearances of the small bowel were similar to those seen in steatorrhœa. Barium enema normal.

Stools positive for occult blood on three occasions.

Glucose-tolerance test, flat curve.

Fat absorption within normal limits (97% absorption).

Direct Coombs test negative.

L.E. cells found in the peripheral blood on four occasions.

Serum-proteins: reversed albumin/globulin ratio on four occasions, with gamma-globulin on one occasion as high as 2·9 g. per 100 ml.

On discharge the hæmoglobin was 13 g. per 100 ml., white cells 8900 (polymorphs 6700) per c.mm. The patient was discharged on folic acid orally 20 mg. b.d., vitamin $B_{12}$ 100 µg. intramuscularly once monthly.

Six weeks later the hæmoglobin was normal but L.E. cells were still present and the albumin/globulin ratio was still reversed.

The patient remained somewhat wasted, weight steady at $7^1/_2$ stone, as in hospital. She complained of rheumatic pains in both shoulders similar to those experienced before admission for treatment of anæmia. It was therefore decided to

5. Bayliss, R. I. S. *in* Modern Trends in Endocrinology; p. 126. London, 1958.

begin treatment with steroids, and the patient is to be seen again later.

We should like to postulate that in this patient there are organic lesions in the small intestine, including the jejunum, due to disseminated lupus erythematosus, which have led to impaired absorption of folic acid and hence to the folic-acid-responsive megaloblastic anæmia.

G. E. F. SUTTON
E. G. WARBURTON.

Bristol Royal Infirmary.

## AN ELECTRO-PRECIPITIN TEST

SIR,—Watson and Whinfrey [1] described "an electro-precipitin test", a method for the detection of antibodies. We had in fact recorded [2] such a method in 1955. We called it "overtaking electrophoresis" (Überwanderungs-elektrophorese). At first [2 3] we used it for the detection of organ antibodies, and later [4–7] for the differentiation of precipitating and non-precipitating antibodies against serum-albumin. We have also applied the method to the quantitative estimation of the reaction between tetanus toxin and antitoxin.[8] Our method has also been used by Hofmann-Credner [9] and Gillich [10] to show the binding of $^{131}$I-labelled thyroxine by plasma-proteins.

Medizinische Univers.-Poliklinik,
Marburg (Lahn), Germany. N. LANG.

## EXCESSIVE GANGLION BLOCKADE PRECIPITATED BY CHEMOTHERAPY

SIR,—The paper by Dr. Balmforth (April 4) interests me very much because his significant observations relate to investigations that my associates and I have made. He states that patients with hypertension and pyelonephritis, when treated with a ganglion-blocking agent *and* with an antibacterial agent, can be precipitated into a severe state of hypotension. In offering an explanation for such a sequence of events he suggested among other possibilities, a release of a vasodepressor substance from organisms in the kidney. I believe that this explanation is most likely correct since we have observed a severe state of hypotension in normotensive patients with bacteræmia due to gram-negative coliform bacteria shortly after initiating chemotherapy. We also recorded [11] the appearance of hypotension in patients with brucellosis and demonstrable brucella bacteræmia, who were treated with chlortetracycline. Similarily, severe and fatal hypotension has been induced in patients with typhoid fever shortly after the initial dose of chloramphenicol. The hypotension is most likely to be due to the liberation of endotoxin from the gram-negative bacilli which follows the antibacterial action of the drugs. Dr. Balmforth is quite right in calling attention to the potential dangers of antibacterial therapy in hypertensive patients with renal infection who are also receiving antihypertensive drugs.

Department of Medicine,
University of Minnesota Hospitals,
The Medical School,
Minneapolis, Minnesota. WESLEY W. SPINK.

1. Watson, D., Whinfrey, H. *Lancet*, 1958, ii, 1375.
2. Lang, N. *Klin. Wschr.* 1955, **33**, 29.
3. Lang, N. Untersuchungen mit radioaktiv markierten Organanti-körpern. Marburg, 1955.
4. Lang, N., Schmidt, J. G. H., Jahrmarker, H. *Zbl. Bakt.* 1955, **164**, 41.
5. Lang, N. International Radioisotope Symposium Bad Gastein, 1956; *in* Radioaktive Isotope in Klinik und Forschung; II, p. 95. Munich and Berlin, 1956.
6. Haan, J., Lang, N. *Klin. Wschr.* 1957, **35**, 1013.
7. Lang, N., Haan, J. *Int. Arch. Allergy*, 1957, **10**, 305.
8. Lang, N. Proceedings of 6th Colloquium on Protides of the Biological Fluids, Bruges, 1958; p. 68. Amsterdam, 1959.
9. Hofmann-Credner, D. *Klin. Wschr.* 1957, **35**, 121.
10. Gillich, K. H. *Z. exp. Med.* 1958, **130**, 415.
11. *J. Amer. med. Ass.* 1948, **138**, 1145.

## FRACTURES OF THE FINGER

SIR,—May I add a comment to your annotation of April 25? Rotational deformity is one of the dangers which, in the treatment of fractures of the proximal and middle phalanges of the fingers, may result in permanent functional and cosmetic disabilities.

Owing to the dorsal convex curve of the metacarpals, the metacarpophalangeal joint axes follow a similar curve, so that when the fingers are fully flexed, the distal interphalangeal joint axes take on a curve in the opposite direction, which is convex to the palm. This effect is increased by tapering of the fingers and is sometimes also complicated by lateral curvatures.

It is therefore apparent that, since the normal shape and function of the hand depends upon the rather complex relationship of the fingers to each other, the correct rotational positioning of finger fractures is important, although not always achieved.

I believe that more frequent use should be made of the technique of flexing the fingers over a palmar bandage pad, using circular strapping to secure them, when immobilisation is indispensible to treatment. This is the only simple method of avoiding residual rotational deformities, since it ensures correct relative alignment of the fingers in all positions of use.

The Promenade Hospital,
Southport. P. J. W. ROWELL.

## DANGERS OF INDWELLING POLYETHYLENE CANNULÆ IN DEEP VEINS

SIR,—Dr. Indar (Feb. 7) stresses the risks in the use of polyethylene cannulæ in deep veins. Since readers of his article might easily be discouraged by his experience I should like to make the following points:

(1) In 9 of the 15 cases described more than 50% of the body surface was burned. It is well known that in such cases there is an increased tendency to thrombosis.

(2) One of the complications mentioned is infection of the vein. This may well be due to the technique of introducing the cannula through a skin incision.

(3) In the only case complicated by pulmonary emboli (case 14) the origin of the embolus was probably a deep vein thrombosis in the calf, quite independent of the use of the cannula.

I have used deep-vein cannulæ in a medical ward in this hospital on more than 20 occasions in the past two years without any complications. The indications were various and included deep shock due to blood-loss, acute pancreatitis, and coma due to barbiturates.

In a patient with multiple hemangliomas associated with thrombocytopenia [1] the cannula remained in the vein for thirty-five days with no untoward effects; in another with subacute bacterial endocarditis, where antibiotic treatment could not be given intramuscularly because of great pain and local induration in both glutei, a polyethylene cannula remained in the vein for thirty-six days.

The method used consists of blind percutaneous puncture of the femoral vein using a 15-gauge needle. About 20 cm. of polyethylene cannula is threaded through the needle, which is then withdrawn.

I use this method in all patients in whom I foresee the necessity of continuous intravenous therapy for more than three days. It is not more dangerous than an intravenous infusion in any other site (thrombophlebitis and pulmonary emboli after infusion in superficial veins are of course not rare); it is certainly less complicated and less dangerous than a venesection. It allows the patient greater freedom of movement than other forms of intravenous therapy, and permits free withdrawal of blood.

Although its possible dangers should be mentioned I do not think that the employment of this useful method should be lightly condemned.

1. Gilon, E., Ramot, B., Sheba, C. *Blood*, 1958, **14**, 75.

*The Lancet* [2] stated: " Publication of further series of cases . . . treated by caval catheterisation would help to define its real value."

I agree with Shaw [3] that the method of intracaval catheterisation is reasonably safe and valuable.

I hope that this letter adds further evidence of the value of polyethylene cannulæ in deep veins for intravenous therapy.

Tel-Hashomer Hospital,
Israel. E. GILON.

## DOCTORS FOR OVERSEAS

SIR,—May I, as another recent visitor to the Near East, confirm Mr. Green-Armytage's plea (April 25) for the acceptance of more postgraduate students in this country, and reinforce the case by my knowledge of the extent of the demand from other countries as well. There are many young doctors who want a period of special training rather than just general " postgraduate education ". It might be possible for specialists at many teaching hospitals to take one student doctor in addition to the normal quota of registrars, but a large part, if not the whole, of the demand could be met by the Postgraduate School at Hammersmith if there were only the space in which to accommodate additional doctors needing special training. New buildings to provide this have just been started at Hammersmith, and it is to be hoped that all those who have at heart the training of doctors from overseas will support the Postgraduate School's Building Appeal, which has already collected over £550,000 towards the construction of those new buildings. Those may also be inclined to support this project who believe that a period of postgraduate work in one place can contribute greatly to increased understanding and friendship between men of many nationalities.

Postgraduate Medical School,
London, W.12. CHARLES NEWMAN.

## FURNITURE AND PSYCHOTHERAPY

SIR,—The correspondence that has been primarily concerned with the Mental Health Bill has raised wider and more general issues.

We should like to join with Dr. Millman (March 7) in wondering how anyone who claims to be so modern as " Deputy Physician Superintendent " (Feb. 21) can be puzzled by the idea that the ordering of furniture is as essential as psychotherapy. Moreover, Dr. Bickford would seem to be the last person whose views could conceivably be described as either archaic or time-worn; unless indeed the practice of psychiatry has taken a gigantic leap forward since the publication of his article, The Forgotten Patient.[4] If so the news of this has escaped us.

It is indeed only within the last decade that the importance of hospital administration as a therapeutic tool has come to be widely accepted—at least in this century—and we would suggest that not only is the provision of furniture and the thousand-and-one other services needed for the day-to-day life of the patient every bit as important as psychotherapy: it is of itself, in skilful hands, a form of psychotherapy. Moreover, whilst the benefits of formal psychotherapy can be brought to only a small number of mental-hospital patients (though this number can be markedly increased by the use of group techniques), the benefits of therapeutic administration can be felt throughout the hospital in a very short time, and are, moreover, available 24 hours a day. Even the nature and placement of the furniture in the room in which psychotherapy is given warrants serious consideration.

Your readers can undoubtedly supply for themselves examples of the skilful provisioning of furniture, food, and clothing having as great an effect on the progress of a patient's return to health as any other therapeutic procedure. However, we would like to cite two examples from our own experience.

One of us was asked to admit to hospital a lady who had reportedly bitten her escort on the way in. She was indeed most reluctant to go to the ward. However, she responded readily enough to an invitation to look around the building, and became so engrossed in discussing the furniture and the interior decoration that she quite forgot her reluctance to enter, and no further problem was encountered on this score.

The second example is that of the patients on the tuberculosis ward of a mental hospital. Review of their weight charts showed that nearly all the patients on this ward had started to put on weight at the same time. Investigation into the cause of this phenomenon revealed that it began shortly after all the patients were transferred from an old building into a tastefully furnished new ward with a cheerful, not to say startling, colour scheme. Other factors such as food, staff, and medication had remained approximately constant.

We do not feel that one has to make a choice between psychotherapy and administration. Good administration is patient-oriented, and one of the tools of administrative therapy is the use of group psychotherapeutic techniques. Milieu therapy is undoubtedly one of the most important treatments available to the large mental hospital, and, as furniture is part of the milieu, its importance can hardly be denied.

We would agree with " Deputy Physician Superintendent " that the possession of a D.P.M. does not confer any particular administrative brilliance on its possessor, nor does it necessarily confer any psychiatric élan: the length, quality, and variety of experience, and the personal attributes of the holder of the diploma are rather more important. We do not suggest that " sitting behind a desk worrying about ' food, clothing, lighting, and furniture ' " constitutes therapeutic administration. The sitting behind the desk and worrying about minute details is an executive function, not an administrative one, and can well be, and indeed often is, left to a hospital secretary or business manager. Nevertheless, the hospital administrator is responsible for general policy and for ensuring that these services meet the needs of the patients, and we would venture to suggest that a psychiatrist (preferably with some direct clinical responsibility) is the best person to do this. This is not to say that some lay administrators have not at times been more aware of the needs of patients than their medical colleagues. William Tuke certainly was. But this is nearer 1970 than 1790.

We would, however, heartily endorse " Deputy Physician Superintendent's " plea for psychiatrists and their families to live outside the hospital. In this State, though psychiatrists are permitted to live within the precincts of the hospital, where such accommodation exists, they are in no case required to do so and are in fact actively encouraged to live within the community.

In conclusion we should like to quote from the *New York Times* of Sunday, March 22, 1959:

MENTAL HOSPITAL OPENING UPTOWN

" A psychiatric hospital with Danish-modern furnishings and American-modern treatment principles will open at 420 East Seventy-sixth Street today . . .

In designing the hospital, care was taken to provide pleasantly furnished rooms in tasteful colors and fabrics with a living-quarter rather than a hospital air.

The studio type of rooms for patients not needing bed care are furnished with Danish-modern furniture that hangs from the walls. It permits the easy moving of the furnishings and simple maintenance. . . . The floor for psychosomatic patients not requiring mental hospital admission cannot be distinguished from the sound-proofed facilities for very disturbed mental patients. Spacious lounges and recreation and dining areas are similar throughout.

According to Dr. Kalinowsky and Dr. Leonard Cammer, hospital director, emphasis will be on a combined therapy approach to give the patients intensive physical and psychological treatment . . ."

Nebraska Psychiatric Institute,
Omaha, Nebraska. ISA SAMAD
FRANK WINSTON.

2. *Lancet*, 1957, ii, 1155.
3. Shaw, G. *ibid.* Jan. 3, 1959, p. 15.
4. Bickford, J. A. R. *Lancet*, 1955, ii, 917, 969.

## DOCTOR AND FACTORY

SIR,—Your recent comment, together with Lord Taylor's two articles on Occupational Health Services, are timely in drawing attention to the present hesitancy in the national development of these services. As you so lucidly state, effective executive preventive action is taken by employers and employees on the doctor's advice and only after they have gained confidence in him. This confidence only follows upon the doctor demonstrating his clinical competence. Regardless of whether he is full or part time he will fail in any preventive activities unless he can demonstrate this competence.

The only apparent feasible solution to the problem of the future development of occupational health services is one which will follow the basic Slough-Harlow pattern of cooperative services. The shortage of medical man-power dominates all possibilities and it is obvious that the general practitioner must provide the main medical staff of any national scheme.

The limitations of Slough and Harlow as experiments are several. Both serve compact industrial estates of limited geographic compass. Both Harlow and Slough are fortunate in possessing dynamic and visionary medical directors who, if they will excuse the expression, are superb salesmen of health (one of the most difficult commodities to sell). American top management, and more lately British, have recognised that such "salesmanship" is essential in the initial development of any type of occupational health service. To foster the nation-wide adoption of such schemes as Lord Taylor's, many more men of his calibre and enthusiasm will be needed. Finally the conditions and pattern of general practice in Harlow are unique in this country. Whether less fortunate practitioners in other areas would be able to devote the necessary time and energy to learning and practising occupational health will require further experiment.

A recent survey on Tyneside [1] revealed some of the difficulties likely to be encountered when establishing, in a mature industrial conurbation, such a cooperative service staffed by general practitioners. The location and classification, by size and product, of the myriads of small factories in such an area is itself a major task. Most factories in this country are haphazardly located within the general urban development, and communications and accessibility are generally much less easy than on trading estates. This means that medical and nursing staff will spend more time travelling and this results in increased staffing and costs. Many of the occupiers of these small factories remain in their old buildings, often equipped with ancient plant and working obsolescent processes simply because they do not have sufficient money available for development. To these people the cost of £2 per head per annum seems much too high in relation to any expected return. There is a real organisational dilemma here. Amongst a random sample of general practitioners, some 80% were found willing to take part in such a service and the majority of these were willing to attend postgraduate courses in occupational health. Yet with the larger lists and higher morbidity loads of these urban areas, could many of these doctors really spare sufficient time and energy to staff the competetent and energetic service which would be needed? To effectively "apply clinical medicine to industry" the industrial medical officer must know, intimately, the environment of his factory. The above survey showed, however, that few doctors at present engaged in industry appeared to be aware of this vital point of industrial practice. Perhaps the limitations on the time they could devote to their industrial work did not allow this; such knowledge is gained only by patient and prolonged observation and investigation.

Finally the geographic spread of industry in these older areas would seem to necessitate much of the clinical work being done in the factories rather than at a central clinic. Here the longer distances and less direct access to such a clinic do not sufficiently reduce the time lost from work to provide that incentive to both employers and employees which you rightly mention as a key selling-point. Yet in the older factories even the most rudimentary treatment facilities are absent so that the provision of some local facilities would be necessary. This all adds to the expense of such a scheme in such an area.

All in all, the development of occupational health services for British industry as a whole would seem to have to follow the pattern of the Slough-Harlow experiments. What is now needed is a similar experiment in an area which is more typical of industrial Britain. Such an experiment would test (in a more representative location) the functional and financial realities of this pattern. Perhaps such an experiment would also reveal what, if any, future legislative provisions will be needed to encourage the development of a national occupational health service.

Erdington, Birmingham. W. T. JONES.

1. Jones, W. T. M.D. Thesis, University of Edinburgh, 1957.

SIR,—Last year I protested in your columns about a leading article in *The Times* of Aug. 4, in which Lord Taylor's contention that "a large part of Industrial Medicine is neither more nor less than general practice" was quoted with approval. I little thought that I should have to take you to task, Sir, for the same fault, but in your leading article last week you repeat it, and in support of Lord Taylor's view you cite McLaughlin who has described industrial medicine as "clinical medicine applied to industry". This is a perfectly reasonable definition, but it does not by any means imply general practice in the factory. Since the average layman tends to regard all medicine as essentially curative in character, I agree with Lord Taylor that the industrialist in the first instance will tend to assess the merits of his medical department on its success in dealing with accident and illness at work, but efficient primary treatment should surely be a means to an end only. In any case, it is not general practice and I remain quite unrepentant in the opinion that any attempt on the part of the industrial physician to encroach on the field of the general practitioner is usually to the patient's detriment, besides being unethical. On the other hand, there is no mystique in the practice of industrial medicine and it is well within the competence of the family physician to undertake such work. But, once again, when he does so he is not engaging in general practice.

Medical Department,
The Butterley Co. Ltd.
Ripley, Derby. G. F. KEATINGE.

## FULMINATING ECLAMPSIA TREATED BY HYPOTHERMIA

SIR,—In his letter of May 2, Dr. Neville refers to the case of eclampsia treated by hypothermia which was described by Wing-Commander Malcolm and his colleagues (April 25). Dr. Neville asks "Is it certain that the hypothermia contributed to their success?", and he implies that it is not.

I would agree with Dr. Neville's implication that the value of hypothermia in this case is not proven, and I would go further and suggest the possibility that hypothermia may actually be contraindicated in such cases.

In a recent review of the physiology of the hypothermic state, Cooper [1] states:

"One disturbing response of cooling on the central nervous system is a lowering of the threshold for the initiation of epileptiform convulsions . . . particularly at temperatures below 30 C. Both electrical stimulation and metrazol in what would normally be subthreshold amounts cause convulsive reactions to occur during hypothermia."

1. Cooper, K. E. *Brit. J. Anæsth.* 1959, **31**, 96.

Although Wing-Commander Malcolm and his colleagues did not propose to allow their patient's temperature to fall below 88°F (31°C), and in the event did not take it down even as far as that, it seems arguable whether the use of hypothermia of any degree can be a rational therapy for convulsions.

The General Infirmary, Leeds. E. P. FITTON.

### TRIAMCINOLONE MYOPATHY

SIR,—May I draw attention to the work of Ellis [1] which showed that widespread necrosis develops in the skeletal muscles of rabbits treated with cortisone acetate?

The animals received 10 mg. per kg. body-weight of cortisone per day for from 7 to 25 days. Necrosis of skeletal muscle-fibres was regularly observed, whereas involuntary muscle (heart, colon, &c.) remained normal. After stopping the drug, muscle-fibres gradually regenerated and complete healing without fibrosis followed.

These experiments suggest that in the case described by Dr. McLean and Mr. Schurr (April 4) the paresis was perhaps not related to the fluorine atom in the 9-alpha position in the steroid nucleus, because in Ellis' experiments muscle necrosis was associated with cortisone acetate *without* a fluorine atom.

Budapest. T. LEHOCZKY.

### APPOINTMENTS SYSTEMS IN GENERAL PRACTICE

SIR,—The *Medical World* is preparing a film on appointments systems in general practice. We have had a good deal of help and advice from several practitioners who are running appointments systems, but in order to give a full picture of the problems involved, it would be useful to have some information from those who have tried an appointments system and subsequently abandoned it.

I would be most grateful if any such practitioners would be kind enough to write to me, giving some account of their attempts to run an appointments system and the reasons why it was discontinued.

H. C. FAULKNER
55–56, Russell Square, London, W.C.1. Chairman, Editorial Advisory Board, *Medical World*.

### PNEUMOTHORAX MACHINES AND NEEDLES

Dr. THOMAS MARMION writes:

"There is being formed at the Wellcome Historical Medical Museum a collection of pneumothorax machines and needles illustrating the various models from the time of the first Forlanini instrument to those invented in the 1940s.

"The nucleus of this collection is at present in Leeds and will be shown, before its transfer to the Wellcome Historical Museum, at a meeting of the British Tuberculosis Association and the Yorkshire Thoracic Society in September. The present collection is nearly complete as regards English models of machines and is complete as regards English needles.

"If any of your readers have Continental, British, or American apparatus that is no longer required, I should be grateful for their loan for the Leeds exhibition; or their gift for the same reason prior to their transfer to the permanent collection to be kept in London. My address is Killingbeck Hospital, York Road, Leeds, 14."

### DR. HUGH CRICHTON-MILLER

Lieut.-Colonel R. F. GORE-BROWNE writes:

"I have been asked by the family of the late Dr. Hugh Crichton-Miller, the psychotherapist and founder of the Tavistock Clinic, to write his life. I should be grateful if any of your readers who have any letters from him or information about him would get in touch with me at The Vineyards, Beaulieu, Hants."

1. Ellis, I. T. *Amer. J. Path.* 1956, **32**, 993.

# Parliament

### Management Techniques and the N.H.S.

THE Minister of Health has announced that the Council he is setting up to advise on the application of modern management techniques in the National Health Service will be known as the National Health Service Advisory Council for Management Efficiency (England and Wales). Its terms of reference are:

> To advise generally on measures for improving efficiency in the National Health Service in England and Wales.

The Council, the Minister said, would concentrate in the first instance on problems of the hospital service. As already announced, Sir Ewart Smith would be chairman, and the other members were: Mr. C. Bartlett, R.M.N., Mr. C. H. Beckett, Prof. T. E. Chester, Mr. A. M. Hudson Davies, Mr. S. Hill, Dr. F. Avery Jones, Mr. S. C. Merivale, F.H.A., Mr. M. W. Perrin, F.R.I.C., Alderman R. G. Robinson, Sir Arthur Thomson, F.R.C.P., Sir Edward Thompson, Mr. G. Watts, F.H.A., and Miss M. L. Young, S.R.N.

### Factories Bill

SPEAKING on April 28 at the second reading of this Bill, which has now been sent to the House of Lords, Lord TAYLOR pointed out that we are apt to forget the background against which the Factories Acts operate. The typical British factory was a small place. There were something like 233,000 factories in this country, but 228,000 of them—that is 98%—employed two hundred and fifty workers or less. Industrial health services were important, for absence due to illness was a hundred times as great as absence due to industrial disputes, and he believed that £780 million to £1000 million were lost each year through illness and accidents in industry. This Bill could mark a new era in industrial health, for it gave the Minister the statutory duty to promote health, safety, and welfare in factories by positively investigating the problems concerned. The biggest problem was how to meet the health needs of the $3^3/_4$ million people who work in factories employing 250 workers or less. It was uneconomical and indeed unnecessary for such factories to employ their own full-time nurse, let alone a part-time doctor. The answer, in Lord Taylor's view, was a cooperative industrial health service such as the schemes at Slough and Harlow.[1]

## QUESTION TIME

### Mental Health Bill and Finance

Mr. KENNETH ROBINSON asked the Minister of Health what action he proposed to take to ensure the development by regional hospitals boards of facilities for the treatment of patients on the lines indicated by the Mental Health Bill; and what special capital and maintenance allocations he would make available to boards for this purpose.—Mr. DEREK WALKER-SMITH replied: Developments in accordance with the principles underlying the Mental Health Bill are already taking place in hospitals on an expanding basis, and more may be expected. Mr. ROBINSON: Does not the Minister agree that if the Bill means anything at all it will inevitably mean a considerable expansion of the mental hospital services, and that he will not get that expansion unless some special allocations are made for this purpose to regional hospital boards?—Mr. WALKER-SMITH: One of the basic principles underlying this Bill is a shift of emphasis from institutional care to care in the community, so that will affect the amount of provision required by hospitals; but, of course, there is much more money available now for capital development in hospitals than there used to be, and about a third of the regional boards' allocations go in the mental health field.

Dr. EDITH SUMMERSKILL: Would the Minister agree that it is of little use giving publicity to the fact that directions will be given to local authorities regarding this unless local authorities and regional hospital boards also know how much

1. *Lancet*, April 25, 1959, p. 875; May 2, 1959, p. 933.

money they will have to spend on this service?—Mr. WALKER-SMITH: The regional hospital boards make their own allocations to the mental health part of their programmes out of their steadily increasing total allocations. In regard to the local health authorities, I have already given the sum included in the general grant calculation for this purpose for the next two-year period.

Mrs. E. M. BRADDOCK: While everybody is very happy that in the Bill the Minister has included most of the Royal Commission's recommendations, is he aware that most of those recommendations depended upon the Commission's other recommendation that there should be a percentage grant to local authorities for a limited period, because this is a new and expanding service in local authorities and progress in it and in new development depends upon additional contributions from the Treasury?—Mr. WALKER-SMITH: Yes, but that recommendation was made before the Local Government Act, 1958, in which the Government, for good reasons which are well known, adopted the principle of the general grant. I think that the best provision possible has been made within that context.

### Appointment of Consultants

Mr. JOHN CRONIN asked the Minister if he would put in hand measures to enable regional hospital boards, where consultants' appointments have been terminated through no fault of their own, to re-employ these consultants in other posts without the necessity of their applying for them in competition through advertisements.—Mr. WALKER-SMITH: I am considering an amendment of the National Health Service (Appointment of Specialists) Regulations, 1950, with this point in mind. Mr. CRONIN: Does this not need careful consideration? Is it not the case that under the present regime, with the advances in medical science and changes in local population, there may be considerable necessity to redeploy consultants and that therefore flexibility is desirable?—Mr. WALKER-SMITH: That is quite true. With the advancing, changing techniques it is desirable to try to have a flexible system.

### Leprosy in Britain

Mr. N. A. PANNELL asked the Minister how many cases of leprosy were known in the United Kingdom at Dec. 31, 1958.—Mr. WALKER-SMITH replied: At Dec. 31, 1958, there were 275 cases of leprosy known in the United Kingdom. Mr. PANNELL: In view of the fact that there were only 46 cases in 1951 and that the number has now risen to 275, can the Minister give any reason for the alarming increase? Does he not think that the situation is becoming so serious that some regulations should be observed, particularly for people coming to this country with this disease?—Mr. WALKER-SMITH: I do not think that the numbers show a situation which could be described as serious. It is true that there are more cases than there were, but these are being treated, and there is no evidence of a spread of leprosy in this country.

### Medical Discharges

Mr. JOHN STRACHEY asked the Secretary of State for War whether he would make arrangements which in future would avoid the discharge on medical grounds from the Army of persons who immediately previously have been accepted as medically fit.—Mr. CHRISTOPHER SOAMES replied: The medical authorities of the Ministry of Labour work closely with those of the Service Departments. They agree together the standards which are to be applied by pre-service medical boards. Over the past nine years, 928,000 national service men entered the Army. Medical discharges during the initial period of service—that is, up to sixteen weeks—numbered 11,000, or about 1% of the total. Those figures include cases in which disability could not have been established before service. The figures show that it is rare for discharges to result from the diverging views of medical boards, and the Minister of Labour and I have every confidence in the present system. Mr. STRACHEY: Does not the Secretary of State see that his reply, which shows that this occurrence is comparatively rare, makes it all the worse that several very prominent individuals have been included in this very small category of persons who have been discharged on the second medical check-up? It is this which has caused public anxiety.—Mr. SOAMES: I personally know of only 2 such cases out of a total of 11,000.

Mr. G. D. N. NABARRO: Is the Minister aware that there is really no excuse at all for Terry Dene, Marty Wilde, Colin Cowdrey, and the remainder being able to evade military service on grounds evidently that they earn large sums of money in civil life or are prominent sportsmen, whereas the overwhelming majority of young men have to do their full two years? Would it not be advisable to allay public disquiet, that we should have a tribunal inquiry about Dene, with full disclosure of the facts, including the medical reports, so that the House and the country may judge the veracity of the statements which have been made by the Army medical authorities?—Mr. SOAMES: I must absolutely refute the inferences cast by my hon. Friend as to the attitude adopted by the medical authorities. There is a small proportion of men who are considered fit for service at the pre-call-up medical board but in the event are found to be unfit—1% of the total over the past nine or ten years. The fact that the proportion is so small reflects credit on the medical profession. Occasionally it happens that one of these men is in the public eye, and that fact attracts publicity. I appreciate that it makes feelings run high. Neither the Adjutant-General's Department nor I, if I intervene in a case, have any alternative but to discharge a man, whatever his name may be, if the medical advice is as definite and unequivocal as it was in the case that the hon. Member has in mind.

### Toxicity of Lipstick Dyes

Lord DOUGLAS OF BARLOCH asked Her Majesty's Government what azo or other synthetic dyes were used in the manufacture of lipstick; what research had been done on the cumulative toxicity of such dyes; and whether any control was exercised over the use of them for this purpose.—Lord CHESHAM replied: I understand that many synthetic dyes have been used in lipstick manufacture for a long time. So far as I am aware, no research has been undertaken on behalf of the Government into the toxicity of the dyes used for this purpose. Lord DOUGLAS OF BARLOCH: Is the noble Lord aware that the Food and Drug Administration of the United States has recently banned no fewer than seventeen synthetic dyes for use in lipstick; and is it not well known that many of these synthetic dyes are cancer inciting? Lord CHESHAM: So far as I know, the American Government have not done anything further than produce a proposal to ban seventeen dyes. This is very much in the early proposal stages and is far from any form of firm decision.

## Obituary

### ARTHUR HENRI CHENARD

M.R.C.S.

Dr. A. H. Chenard died on April 25 at Kumasi, Ghana, where he had practised since he retired from the Colonial Medical Service. He was 53.

His full name, which he normally did not use, was Chenard de la Giroudais. He qualified from Charing Cross Hospital in 1932. He held resident appointments in London at Queen Charlotte's Hospital and the Chelsea Hospital for Women, and he served for many years in the Colonial Medical Service at Accra.

R. D. R. writes:

Harry Chenard was hard-working and efficient and an excellent teacher. Under his direction the standard of maternity work in Accra was high. He inspired respect and love in his African staff and patients, and never spared himself. He was forced by coronary disease to retire at an early age from Government service, but he continued to practise medicine in Kumasi. He was an excellent host and a most amusing conversationalist.

# Notes and News

## EXPANSION OF THE MENTAL HEALTH SERVICES

THE Minister of Health has sent circulars to local and hospital authorities and executive councils suggesting ways by which the care of the mental patient may be shifted, wherever appropriate, from the hospital to the community. This proposal, which was one of the main recommendations of the Royal Commission, will be given legislative support by the Bill which is now before Parliament. But as the Government has already accepted the Royal Commission's general recommendations, the Minister points out that there is no need for administrative action to wait on legislation. He has accordingly asked local authorities (circular 9/59) to review immediately their existing mental health services and to decide how best these can be developed to meet present and future needs. He suggests that they should at first concentrate on junior and adult training centres, hostels or residential homes, social centres, and home-visiting services. Generally he thinks that authorities should keep in the forefront the need for training children up to 16 years of age and make early provision for those now living in the community for whom hospital admission could be avoided if suitable services were available.

The success of community care will largely depend on the cooperation of the family doctor, and in his circular to executive councils (E.C.N. 297; E.C.L. 27/59) the Minister says that they will need to keep themselves fully informed of local services. They should also be invited to attend case conferences on their own patients, and hospitals should where possible consult them before a patient is discharged to his home.

In his memorandum to hospital authorities (H.M.[59]46) the Minister also lays stress on the need for a close relationship between the hospital, the family doctor, and the community. In some areas administrative measures which have been found useful include joint appointments (where, for example, a hospital consultant psychiatrist also acts for the local health authority), joint case conferences, and the appointment of the M.O.H. to hospital committees. Other suggestions put forward by the Minister to the hospitals deal with their own problems, including security arrangements and patients' pocket-money and payments.

## SUPERANNUATION FOR DOCTORS LEAVING BRITISH STATUTORY HEALTH SERVICES

DOCTORS previously engaged in the National Health Service or other statutory health service who leave to undertake salaried whole-time employment elsewhere in the United Kingdom or overseas may have superannuation benefits earned under the National Health Service scheme "frozen", provided that the new employment is one which can be "approved" for the purpose; but the conditions are stringent, and unless they are fulfilled the employer's part of the frozen benefit is lost. The alternative method, which is not accompanied by such restrictive conditions, is to secure a transfer of the benefits earned under the statutory scheme. This transfer—commonly known as a transfer-value payment—cannot be made to the doctor himself, or to his new employer, or to an insurance company. But it can be made to the Federated Superannuation Scheme for Nurses and Hospital Officers (F.S.S.N.), provided that on entering the new employment the doctor becomes a contributing member of F.S.S.N.—irrespective of whether his new employer also makes contributions in respect of him. Under F.S.S.N. the doctor can provide for his family by choosing (from a panel of 15 insurance companies) endowment assurance policies, with or without profits, or an alternative form of endowment assurance which includes family income benefits.

Nurses, nurse receptionists, medical ancillaries, technicians, and medical secretaries are eligible for F.S.S.N. membership; and doctors employing such staff in their private practice can become participating employers in F.S.S.N., with resultant tax relief on the F.S.S.N. premium payments.

Inquiries may be addressed to the General Manager, F.S.S.N., Rosehill, Park Road, Banstead, Surrey.

## MEDICAL DEVELOPMENT IN WESTERN NIGERIA

IN the present financial year £500,000 is to be spent by the Western Nigerian Government on augmenting the medical services of the region. At the moment there are 25 Government hospitals (as against 12 in 1954) to serve a population of $6\frac{1}{2}$ million. The new programme includes 4 new cottage hospitals and 10 rural health centres, besides providing additional dispensaries and a maternity centre for each of the 80 constituencies in the region. In addition the dental services—at present confined to three areas only—are to be enlarged.

From the profits of the Government's lottery scheme a chest clinic, costing £33,000, has been built at Ibadan. As part of the Government's programme for controlling juvenile delinquency, an approved school for 200 boys has been opened at Iwo.

## X-RAY CAMPAIGN IN EXETER

THE Exeter city council and the South Western Regional Hospital Board are cooperating in an effort to persuade everyone in Exeter over the age of 15 to have his chest radiographed in the period May 25 to June 27. During this time six radiography units are to be stationed at convenient points in the city. A booklet [1] points out that "we are now at a critical phase in the campaign against a disease which has killed over 5 million people in England and Wales in the last 100 years, and which still causes half of all deaths due to infection in this country". With antituberculous chemotherapy the decline in mortality has been spectacular, but the decline in the notification of new cases has not been proportional. In particular, recent figures for Exeter have shown a significant excess over the country as a whole for both morbidity and mortality from tuberculosis.

The city has been divided into 17 areas with a committee to organise the work of the 2000 volunteer workers who will be required. These will publicise the campaign, besides encouraging those who have failed to attend; and it is hoped to provide transport for the elderly.

As well as outlining the plan of campaign, the booklet gives the reasons why everyone should have his chest radiographed. The questions that are most likely to be asked are also answered—in particular on the rapid effectiveness of modern antituberculous therapy, and the lack of any radiation risk.

## NOTES ON THE LAW ON ANIMAL EXPERIMENTS

THE second edition of this pamphlet [2] has been largely rewritten since it was first published in 1950. Its principal intention remains to simplify the task of obtaining licences and certificates for animal experiments under the Cruelty to Animals Act (1876).

Since 1950 there have been three main changes in Home Office practice for such experiments; these have to do with the use of curare, the taking of cinematographic records of experiments, and the licensing of technicians. A discussion on these changes is included in this new edition.

## CHIROPODY SERVICE

THE Minister of Health, who announced in the House of Commons on March 2 that chiropody services could be provided under the National Health Service, has now asked local-health authorities to submit their proposals for the establishment or extension of existing local arrangements. These new proposals should indicate the extent and method of providing the chiropody service intended at first, but should allow for later development or variation.

In the early stages the Minister suggests that priority should be given to the elderly, the physically handicapped, and expectant mothers. He hopes that existing buildings will be used whenever possible. Domiciliary visits may be necessary, but the provision of transport for the patient may be more economical in some cases.

Reasonable charges may be made, according to the means of the patient. (On a national basis the cost of the chiropody

1. Issued by the Health Department, 5, Southernhay West, Exeter.
2. Notes on the Law relating to Experiments on Animals in Great Britain. Issued by the Research Defence Society, 11, Chandos Street, London, W.1. 1959. Pp. 16. 1*s.* 6*d.*

service may rise to between £1 and £2 million over the next few years.) Only chiropodists with approved qualifications may be employed.

The Minister's approval is no longer required for contributions by local authorities to the funds of voluntary organisations providing chiropody services for elderly people. In some areas a continuation of local voluntary organisations at clubs and elsewhere may be the most acceptable way of meeting the needs of this age-group for some time to come.

## Royal College of Physicians of London

At a comitia of the college held on April 30, with Dr. Robert Platt, the president, in the chair, the following were elected to the fellowship:

MIN SEIN, Burma; E. F. BROOKS, Canada; RAJMAL KASLIWAL, India; C. B. PROWSE, Hove; I. O. THORBURN, Australia; ARTHUR LANDAU, South Africa; F. J. WRIGHT, Edinburgh; ALBERTINE WINNER, London; MERVYN WILLIAMS, New Zealand; A. L. JACOBS, London; W. H. HILL, Canada; W. H. P. CANT, Birmingham; N. M. JACOBY, Tunbridge Wells; C. A. LILLICRAP, Lincoln; P. E. C. MANSON-BAHR, Kenya; N. H. MARTIN, London; J. W. PAULLEY, Ipswich; G. S. GRAVESON, Winchester; JOHN APLEY, Bath; T. C. STUDDERT, Carlisle; L. P. R. FOURMAN, Cardiff; G. O. RICHARDSON, Newcastle upon Tyne; M. J. PARSONAGE, Leeds; J. R. BOLTON, Bath; J. J. KEMPTON, Reading; G. C. WELLS, London; R. R. ANDREW, Australia; Lieut.-Colonel J. P. BAIRD, R.A.M.C.; W. ST. C. SYMMERS, London; J. N. M. CHALMERS, Birmingham; E. G. WADE, Manchester; H. W. BALME, London; R. E. KELLY, London; JOHN BADENOCH, Oxford; A. C. BOYLE, London; PHILIP HUGH-JONES, London; ERWIN STENGEL, Sheffield; HENRY BARCROFT, London; J. D. W. PEARCE, London; G. D. W. CAMERON, Canada; R. R. RACE, London; WILSON SMITH, London.

The following having satisfied the censors' board were elected to the membership:

A. S. Alvarez, M.B. Birm., J. G. Banwell, B.M. Oxon., R. W. A. C. Barton, M.B. Lond., Debjiban Basu, M.B. Calcutta, A. D. Cameron, M.B. N.Z., B. G. B. Christie, M.B. Lond., A. N. G. Clark, M.D. Leeds, D. N. Croft, B.M. Oxon., M. J. R. Dawkins, M.B. Cantab., M. A. Denborough, M.B. Cape Town, Joan M. Evans, M.B. Wales, A. G. Giddins, M.B. Lond., Hymie Gordon, M.D. Cape Town, E. L. Harris, M.B. W'srand, A. B. Herring, B.M. Oxon., Kranti Prasad Jain, M.B. Lucknow, G. B. Kiddle, M.B. N.Z., R. K. Levick, M.B. Wales, D. A. Lillicrap, B.M. Oxon., Ida Macalpine, M.D. Erlangen, C. F. McCarthy, M.B. N.U.I., A. W. McKenzie, M.B. Edin., A. C. Markus, B.M. Oxon., Emanuel Moran, M.B. Cantab., George Preswick, M.B. Sydney, David Rabinowitz, M.B. W'srand, M. D. Rawson M.B. Leeds, A. R. Ridley, M.B. Durh., B. H. B. Robinson, M.B. Cantab., D. C. Robinson, B.M. Oxon., S. J. Saunders, M.B. Cape Town, H. S. Schutta, M.B. Sydney, B. A. Scobie, M.B. N.Z., Margaret C. Sidey, M.B. N.Z., A. J. Smith, B.M. Oxon., C. M. Tonks, M.B. Leeds, Ian Weinbren, M.B. Cantab., L. G. Whitby, M.B. Camb., M. J. Williams, M.B. Aberd., G. E. W. Wolstenholme, O.B.E., M.B. Cantab., Brian Woods, M.B. Cantab., N. L. Wright, M.D. Belf., H. J. Wyatt, M.B. Lond., D. N. Wysham, M.D. Harvard.

Licences to practise were conferred on the following 152 candidates who have passed the final examination of the Conjoint Board:

Alfy Tadros Abdel-Messieh, B. H. Ackers, S. Olushola Adenle, Margaret J. Alderton, Abdelraheem Saber Ali, Jennier A. Allcock, M. G. Askew, P. R. Barton, Mary H. Bell, P. M. J. Bennett, A. M. Birt, M. R. Boundy, J. K. Brennand, Margaret J. Brient, P. L. Brooks, J. N. Burgess, Ralph Burrows-Peakin, W. H. Butler, P. G. C. Calverley, R. H. C. Catty, P. C. S. Chapman, F. R. Cianchi, W. H. Clegg, J. H. Cole, Catherine M. M. Cordiner, W. G. R. Couldrick, A. J. Cox, Felicity C. A. Cox, D. D. Craig, Alan Curd, Rex Davidson, Ann Davies, David Davies, P. W. Davis, G. H. Dickson, Judith Dimock, J. W. Dubery, Rameshwarlal Dukhi, C. S. Dutton, M. L. Ellis, John Farmer, Mahmud Abdalla Fayyad, Elizabeth A. Featherby, Dorothy J. O. Ffoulkes-Crabbe, T. G. Gilfillan, J. M. Glaisyer, Mervin Glasser, Alan Gooding, Dulcie G. Gooding, A. J. Gould, L. H. Grove, D. R. Groves, A. W. Harris, Joan P. Hill, Ann Hodgson, Judith Ann Houghton, K. A. Howlett, R. B. Huddy, Ursula S. James, Waclaw Feliks Jaworski, D. M. Jennens, Michael Johnson, A. F. Johnston, B. C. Jones, D. C. Jones, W. M. Jones, Haddad Omer Karoum, N. R. M. Kay, E. D. Keen, J. B. Kelly, Pamela M. Kendall, F. I. D. Konotey-Ahulu, P. J. Lacey, M. H. Lader, C. G. Lake, Astrida Lambergs, K. D. E. Lawrey, O. C. Legg, F. J. J. Letemendia, G. M. Levene, J. H. Lewis, Diana J. M. Lister, Doreen M. Lovern, Peter McErlean, D. C. McNeill, G. S. Makin, B. S. Mantell, K. C. Markwick, Robin Marsh, J. C. Marwood, C. J. M. Maxwell, Varazdad Melikian, C. C. Merry, J. D. Monger, Margaret J. Moody, M. R. R. Moore, T. J. Mott, J. T. Mucklow, P. J. Mullin, C. D. Neal, R. G. Notley, B. W. Oakley, H. L. Parfitt, Adiline W. Patterson, M. J. L. Patterson, J. E. Perrin, Jean S. Pilkington, Janet A. Pinner, Anthony Plews, Vajri Promtatvethi, Hazel M. Rawlinson, Alan Rhodes, Peter Robson, B. K. Rogers, B. S. Rose, W. N. T. Roy, Paul Sadler, M. D. Sanders, Peter Saywood, J. S. Seaton, Anne Seymour, M. O. Sime, B. J. G. Skeet, R. B. D. Skidmore, Joyce I. Skinner, A. W. Sollom, Neilma J. Staunton, Carlyle A. Steen, J. H. Stiff, D. J. Stuath, R. M. Swinburne, Edmund Tapp, Ann P. Taylor, Gordon Taylor, A. J. Thomas, W. K. Thomas, Pamela I. Tinslay, Winifred M. M. Tully, Janet B. Tyler, J. L. Verbov, J. A. Wall, G. G. Ward, Rosemary V. H. Ward, Joyce Wardle, G. S. Welch, P. T. Whitehead, K. L. Williams, M. K. Williams, Melville Leslie Stewart Woods, Michael John Frank Woolmore, Robert Grahame Wrangham, Robin Sproul McFarlane.

The following diplomas and those mentioned in our issue of April 18 (p. 843) were conferred jointly with the Royal College of Surgeons:

*D.Phys.Med.*—Robert Fuller.
*D.P.M.*—C. P. B. Brook.
*D.T.M. & H.*—J. F. Ainslie, Athar Husain.

## British Association of Physical Medicine

The following have been elected officers for 1959–60:

Dr. H. A. Burt, president; Dr. Philippe Bauwens, Dr. W. S Tegner, vice-presidents; Dr. John Shulman, hon. treasurer; Dr. A. T. Richardson, hon. secretary; Dr. A. C. Boyle, hon. editor.

## Essentials of Hospital Administration

The Royal Institute of Public Administration will hold a study conference on this subject for members of mental hospital group management committees on Friday and Saturday, June 26 and 27, in London. The speakers will include Dr. T. P. Rees. Further particulars may be had from the institute, 76A, New Cavendish Street, W.1.

## Doctors' and Midwives' Certificates

The Minister of Pensions and National Insurance has asked the National Insurance Advisory Committee to review the rules under which certificates are given by doctors and midwives under the National Insurance scheme. Representations should be sent in writing before July 21 to the secretary of the committee, 10, John Adam Street, London, W.C.2.

## Is the Medical Examination Worth While?

Dr. C. R. Lowe will speak on this subject at an all-day conference, arranged by the Industrial Welfare Society, at the Queen's Hotel, Birmingham, on Wednesday, June 17. Dr. R. L. Ferguson and Dr. W. Jeaffreson Lloyd will also speak. Further particulars may be had from the society, Robert Hyde House, 48, Bryanston Square, London, W.1.

## Control of Therapeutic Substances

Under the Therapeutic Substances (Control of Sale and Supply) Regulations, 1959, the Therapeutic Substances Act, 1956, is to apply from May 11 to the following substances: (1) cycloserine and salts thereof; (2) all derivatives of cortisone, hydrocortisone, prednisone, and prednisolone respectively with hydroxyl or alkyl groups or halogens as substituents, and to esters and salts of esters of such derivatives; and (3) esters of oleandomycin and salts of such esters.

## British Standards Specifications

The following new British Standards have been specified:

(*a*) Interchangeable fittings for cystoscopic instruments, comprising components of the cystoscope lock, wappler-type switch, and irrigation coupling (B.S. 3038: 1959).

(*b*) Small incinerators for the destruction of soiled dressings in or near hospital wards, and larger centrally situated incinerators for the destruction of general waste and other material—e.g., from maternity wards and operating-theatres (B.S. 3107: 1959).

(*c*) A "general purpose" trolley for anæsthetists, designed to carry small instruments and to act as a table, but not to carry the full equipment of gas cylinders, &c. (B.S. 3112: 1959).

Copies of these standards, price 4*s.* for (*a*) or (*b*) and 5*s.* for (*c*), may be had from the Sales Branch, British Standards Institution, 2, Park Street, London, W.1.

## Association of British Pharmaceutical Industry

Proposing The Guests at the Association's annual dinner in London on April 30, Dr. T. H. M. Kerfoot, the president, said that a series of brochures is being prepared to make the achievements of the industry more widely known. He thought that the industry's contribution to the treatment of major diseases not endemic in Great Britain—leprosy, yaws, trachoma, bilharzia, and malaria—might prove to have a political and social value beyond imagination.

Responding, Mr. Derek Walker-Smith, Minister of Health, said that if on the one hand the Ministry was zealous in obtaining good value for its money, it was also concerned in rebutting misrepresentation of the industry. It might be premature to assess the effects of the 3-year voluntary price-regulation scheme, but he wondered if there was not some room for lower prices without endangering further progress.

Mr. Walker-Smith said that a total of $26\frac{1}{4}$ million doses of poliomyelitis vaccine has been distributed, $5\frac{1}{4}$ million in the past month. He welcomed the recent zeal for vaccination, tardy though it might be, and promised that vaccination will be rapidly available for all who register.

### Scottish Registrar General

Mr. A. B. Taylor, an assistant secretary in the Department of Health for Scotland, has been appointed Registrar General of births, marriages, and deaths in Scotland. He succeeds Mr. F. A. Hogan, who retires at the end of this month.

### British Council for Rehabilitation

The annual general meeting of this council will be held on Friday, May 15, at 3 P.M., in H.Q.S. *Wellington*, Temple Stairs, Victoria Embankment, London, W.C.2, when Dr. Ludwig Guttmann will give the Dame Georgiana Buller lecture. He is to speak on the place of our spinal paraplegic fellow men in society.

Sir George Pickering and Mr. Denis Browne are making lecture tours in the Near East under the auspices of the British Council.

Cambridge University Medical School will hold a symposium for general practitioners on Saturday, May 23, at 10.30 A.M. at Addenbrooke's Hospital, Cambridge, on gastrointestinal diseases. Applications should reach the secretary of the medical school, Tennis Court Road, Cambridge, not later than May 16.

The annual general meeting of the Mental After Care Association will be held on Monday, May 11, at 2.45 P.M., in the Haberdashers' Hall, Staining Lane, London, E.C.2.

The Southern England and South Wales region of the Association of Clinical Biochemists will hold a meeting at Wallingford on May 23 and 24. Further particulars may be had from Mr. G. Higgins, department of biochemistry, Radcliffe Infirmary, Oxford.

## Appointments

BRIDGER, J. W. E., M.R.C.S.: senior assistant M.O., Middlesex County Council (area no. 8).

DUB, ISIDOR, M.D. Prague: assistant senior M.O. (school health service), Leicester.

MACGREGOR, G. A., M.D. Lond., M.R.C.P.: consultant in general medicine, Holy Cross Hospital, Haslemere.

MALLOCH, J. D., M.B. Edin., F.R.C.S.E.: part-time consultant orthopædic surgeon, Scunthorpe and Lincoln area hospitals.

RITCHIE, E. A., M.B. Lond., M.R.C.P., D.P.M.: consultant psychiatrist, St. Augustine's Hospital, Canterbury.

ROPER, A. F., M.R.C.S., F.F.A. R.C.S.: part-time consultant anæsthetist, Nottingham area hospitals.

WILLIAMS, ROGER, M.B. Lond.: assistant M.O., Middlesex County Council (area no. 10).

**Birmingham Regional Hospital Board:**

ARMITAGE, G. H., M.B. Edin., F.R.C.P.E., D.P.M.: consultant psychiatrist, St. Matthew's Hospital, Burntwood.

GENEVER, R. J., M.B. Birm., F.F.A. R.C.S.: part-time consultant anæsthetist, Stoke-on-Trent group of hospitals.

HOCKING, A. E., M.B. Melb., F.F.A. R.C.S., D.A.: part-time consultant anæsthetist, South Warwickshire group of hospitals.

TIBBITS, J. C. N., M.B. Birm., D.P.M.: consultant psychiatrist and deputy medical superintendent, Hollymoor Hospital, Birmingham.

WOOLF, P. G., M.R.C.S., D.P.M.: consultant psychiatrist, Central Hospital, near Warwick.

**Colonial Appointments:**

ARCHIBALD, H. M., M.B.E., M.B. Glasg., D.P.H.: senior specialist (malariologist), Northern Nigeria.

BARROW, W. R., M.B. Lond., D.M.R.T.: radiologist, health department, Trinidad.

CHARLES, B. A., M.B. Aberd.: district M.O., Grenada.

DEEPAN, INDRAJEET, M.B. Durh.: M.O., Trinidad.

GHOSH, T. S., M.B. Calcutta, M.R.C.O.G.: specialist obstetrician, Western Nigeria.

HEAL, P. C., M.B. Cantab.: M.O., Uganda.

LEWTHWAITE, C. J., M.B.: M.O., Uganda.

LISTER, R. W., M.B. Cantab.: pathologist, ministry of health, Northern Nigeria.

MCCREERY, W. C. C., M.B. Dubl.: M.O., Hong Kong.

MACTAGGART, MARY R., M.B. Glasg.: M.O., Northern Nigeria.

OTWAY, T. W., M.R.C.S.: district M.O., Grenada.

PTASZYNSKI, R. Z., M.D. Lwow: M.O. (pneumoconiosis), Northern Rhodesia.

RAYMOND, A. B. W., M.B. Ceylon: M.O., Sierra Leone.

ROSS, A. D., M.B. Edin., D.P.M., D.T.M. & H.: senior health officer, endemic diseases division, ministry of health, Northern Nigeria.

SPENCE, L. P., M.B. Brist., D.T.M. & H., DIP.BACT.: pathologist (grade A), health department, Trinidad.

UNDERWOOD, R. A., M.B. Lond.: M.O., Uganda.

VAN DEN BERGH, J. J. F., M.D. Groningen: M.O., Northern Nigeria.

## Births, Marriages, and Deaths

### BIRTH

KELSALL.—On May 2, in London, to Margaret (née Miller), wife of Dr. A. R. Kelsall—a daughter.

## Diary of the Week

MAY 10 TO 16

### Monday, 11th

POSTGRADUATE MEDICAL SCHOOL, Ducane Road, W.12
4 P.M. Dr. G. J. Popjak: Lipid Metabolism and Atheroma.

INSTITUTE OF DERMATOLOGY, Lisle Street, W.C.2
5.30 P.M. Dr. Max Grolnick: Allergic Dermatitis with Implications in Industry.

WRIGHT-FLEMING INSTITUTE OF MICROBIOLOGY, St. Mary's Hospital Medical School, Paddington, W.2
5 P.M. Prof. G. W. Beadle (Pasadena, California): The Molecular Basis of Heredity. (Almroth Wright lecture.)

BRITISH ASSOCIATION OF SPORT AND MEDICINE
5 P.M. (Westminster Hospital Medical School, Horseferry Road, S.W.1.) Sir Adolphe Abrahams: Nutrition and Athletics.

### Tuesday, 12th

UNIVERSITY OF LONDON
5.30 P.M. (Middlesex Hospital Medical School, Mortimer Street, W.1.) Prof. J. C. Beck (Montreal): Regulation of Adrenal Cortical Function.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
5.30 P.M. *Experimental Medicine.* Prof. J. H. Burn: Experimental Pharmacology of Heart-failure. Dr. W. Modell (New York): Assessment of the Treatment of Heart-failure.
8 P.M. *Psychiatry.* Dr. H. V. Dicks, Dr. Carice Ellison, Dr. G. L. Russell: Sexual Problems in Marriage.

ST. MARY'S HOSPITAL MEDICAL SCHOOL, London, W.2.
5 P.M. Dr. Magnus Haines: Gynæcological Pathology.

GUY'S HOSPITAL MEDICAL SCHOOL, London Bridge, S.E.1
5 P.M. Sir George Thomson: Principles of Physics. (Fison lecture.)

BIRMINGHAM MEDICAL INSTITUTE, 36 Harborne Road, Edgbaston.
8 P.M. *Psychiatry.* Prof. Martin Roth: A New Neurotic Syndrome and its Bearing Upon the Classification of Neurotic Illness.

### Wednesday, 13th

POSTGRADUATE MEDICAL SCHOOL
2 P.M. Dr. E. F. Gale: Disorganisation of the Bacterial Cell by Antibiotics.

INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. Arthur Tickner: Biochemistry of Psoriasis.

INSTITUTE OF DISEASES OF THE CHEST, Brompton, S.W.3
5 P.M. Dr. R. W. Riddell: Aspergilli as a Cause of Pulmonary Disorders.

INSTITUTE OF CHILD HEALTH, The Hospital for Sick Children, Great Ormond Street, W.C.1
5 P.M. Dr. David Yi-Yung Hsia (Chicago): The Infant of the Diabetic Mother.

OXFORD UNIVERSITY
5 P.M. (Radcliffe Infirmary.) Dr. Eliot Slater: Genetics of Mental Disease. (Litchfield lecture.)

### Thursday, 14th

UNIVERSITY OF LONDON
5.30 P.M. (St. Thomas's Hospital Medical School, S.E.1.) Prof. B. E. Ingelmark (Göteborg): Functional Anatomy of the Locomotive Organs Including the Spine.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL, Hyde Park Corner, S.W.1
5.30 P.M. Prof. P. B. Medawar: Immunological Tolerance. (Thomas Young lecture.)

POSTGRADUATE MEDICAL SCHOOL
4 P.M. Dr. J. D. N. Nabarro: Chemotherapy of the Reticuloses.

ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY, Lisle Street, W.C.2
5 P.M. Dr. H. A. Dunlop: Surface Lesions of Reiter's Disease.

UNIVERSITY OF ST. ANDREWS
5 P.M. (Queen's College, Small's Wynd, Dundee.) Prof. W. L. M. Perry: History of Poliomyelitis Vaccination in Great Britain.

### Friday, 15th

POSTGRADUATE MEDICAL SCHOOL
10 A.M. Dr. T. G. Ward: Management of Maxillofacial Injuries.
2 P.M. Dr. J. H. Gibbon (Philadelphia): Surgical Researches in the Jefferson Medical College of Philadelphia.

INSTITUTE OF DERMATOLOGY
4.30 P.M. Dr. William Frain-Bell: Primary Skin Cancer.

UNIVERSITY OF LIVERPOOL
5.15 P.M. (New Medical School, Ashton Street, Liverpool.) Dr. James Sharpe: The Scope for Orthopædic Treatment in Rheumatoid Arthritis.

The annual dinner of the Indian Medical Service Dinner Club will be held at the East India and Sports Club, St. James's Square, London, S.W.1, on Friday, June 12, at 7.30 P.M. Tickets and information may be had from the secretary of the club, Medical Board Room, Commonwealth Relations Office, Matthew Parker Street, S.W.1.

The course in community nursing which is to be held at Manchester is to start in October instead of June.

In Bristol, Marlborough House is the occupational and industrial centre for mentally defective children and young adults. With the consent of the parents of these children a film has been made showing the activities and training offered them. The scenes were shot by Bristol Cine Society. *Marlborough House* (16 mm. colour) has a sound commentary and lasts about twelve minutes. The hiring fee is one guinea: applications should be sent to the medical officer of health, Central Health Clinic, Tower Hill, Bristol, 2.